



भारतीय दूरसंचार विनियामक प्राधिकरण  
**Telecom Regulatory Authority of India**

**Consultation Paper on  
Data Communication Services Between Aircraft  
and Ground Stations Provided by Organizations  
Other Than Airports Authority of India**

New Delhi, India  
10<sup>th</sup> December 2022



**Written Comments on the Consultation Paper are invited from the stakeholders by 09.01.2023 and counter-comments by 23.01.2023. Comments and counter-comments will be posted on TRAI's website [www.trai.gov.in](http://www.trai.gov.in). The comments and counter-comments may be sent, preferably in electronic form, to Shri Akhilesh Kumar Trivedi, Advisor (Networks, Spectrum and Licensing), TRAI on the email ID [advmn@traigov.in](mailto:advmn@traigov.in).**

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## CHAPTER I INTRODUCTION

### **A. DoT's Reference dated 12.04.2022**

- 1.1 Through a reference dated 12.04.2022 (**Annexure-I**), the Department of Telecommunications (DoT), Ministry of Communications, Government of India requested Telecom Regulatory Authority of India (hereinafter, referred to as "the Authority") to submit recommendations under Section 11(1)(a) of TRAI Act, 1997 (as amended) on frequency assignment for data communication services between aircraft and ground stations for services provided by organizations other than the Airport Authority of India. The said reference is reproduced below:

*"During 2006-2010, this Ministry made frequency assignments to M/s Société Internationale de Telecommunications Aeronautiques, (SITA) and M/s Bird Consultancy Services (BCS) to operate VHF<sup>1</sup> Data Communication Link between aircrafts and ground. M/s SITA was assigned 131.725 MHz and 136.975 MHz to operate at 28 airports; and M/s BCS was assigned 131.825 MHz to operate at 04 airports (List of airports attached Annexure-1). The spectrum charges were levied as per Order issued in 1987, and Corrigendum there to issued on 06/05/2003. This order was revised in 2005 and March 2012. (copy of relevant orders are attached as Annexure-2 to 5, respectively).*

*2. During 2012, M/s BCS; and during 2014-2015 and 2021, M/s SITA; applied to this Ministry to add More stations to their network. M/s SITA applied for 15 additional locations and M/s BCS applied for 10 additional airports in the country (Annexure-6).*

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<sup>1</sup> VHF is an acronym of Very High Frequency. VHF is the designation for the range of radio frequency electromagnetic waves (radio waves) from 30 MHz to 300 MHz.

3. While processing the applications for additional locations, a concern was raised that the operations by both M/s SITA and M/s BCS were not captive (internal use) in nature, and there could have a commercial angle in the operation that involved a service rendered to airlines operators. A further concern was whether such services, being offered in a sensitive area as civil aviation, should be regulated under any "service license". Accordingly, a letter was written to Directorate General of Civil Aviation (DGCA) on 05.05.2014 and 04.08.2014) (see Annexure 7 and 8) requesting them to inform DOT, mentioning the sensitive nature of the communications that may be involved in these data communications, whether DGCA had given any permission / authorization to the two organizations to provide Data-based services to airlines at different airports. DGCA was also requested to clarify whether there were any regulatory framework under which such services were mandated to be provided by the two organisations to airlines. DGCA replied on 02.06 2016 (See Annexure 9) that they had not given any permission/authorization to provide data-link services to any organisation as there were no regulations for the same. However, they provided a copy of air safety circular (4 of 2014) dated 05.05.2014 issued by them, (see Annexure 10) which requires airline operators to use all suitable means to track their aircraft on real-time basis.

3.1 The frequency assignments for the additional locations requested by M/s SITA and M/s BCS were not made by DOT then, however, the existing licenses were not cancelled and were renewed based on request of the applicants. SITA has renewed their licensed up to 2021. However, M/s BCS has not renewed their licenses after 2014.

4. As per information made available to DOT by M/s BCS, both organisations use the assigned radio frequency to provide those service (data based services) to airlines operators which is not already provided by the Airport Authority of India (voice based communication mainly the Air traffic control service, i.e. 'ATC'). Further, as per clarification provided by these organisations, the air-to-ground data link is used to obtain information from aircrafts such as passenger information, aircraft engine parameters, etc. through "Aircraft Communication Addressing and Reporting system (ACAR)". operated under

*relevant International standards (ARINC etc.). Aeronautical Radio, Incorporated (ARINC), established in 1929, is a major provider of transport communications and systems engineering solutions for eight industries viz. aviation, airports, defense, healthcare, networks, security etc.*

*5. The VHF data link services consist of the data for the tracking the aircraft for safety of flights. The data includes the position reports, weather updates, engine health messages etc. Considering that VHF Data Link Services to provide ACAR service can be beneficial to track aircrafts on a real-time basis and help investigations/ search and rescue operations in the unfortunate event of aviation disaster, TRAI is requested, under the terms of clause 11(1)(a) of TRAI Act, 1997 as amended by TRAI Amendment Act,2000 to provide recommendation on the following.*

- i. An appropriate mechanism to regulate the services provided by these organizations:*
- ii. The manner in which the frequency assignment should be made to these organizations, in light of the supreme Court judgment made in the 2G case in 2012 - to assign radio frequencies only through auction."*

1.2 Through a letter dated 28.09.2022, the Authority sought certain additional information/ clarifications from DoT on the subject. DoT provided its response through a letter dated 19.10.2022. Regarding the providers of VHF data communication services between aircraft and ground stations in India, DoT informed that *"[a]s per the record only M/s SITA and M/s Bird consultancy Services Ltd have been issued captive licences for the said purpose"*. Further regarding the steps of application process for grant of Wireless Operating License (WOL), DoT informed as below:

*"The procedure of issuing wireless operating license is being done through online portal [www.saralsanchar.gov.in](http://www.saralsanchar.gov.in) portal. The applicant will be required to apply online and Letter-of-Intent (LoI) will be generated after scrutiny of the application. The payment of applicable fee will be made online and immediately*

*a Decision Letter (DL)/ Agreement-In-Principle (AIP) letter will be generated automatically. The application will be forwarded to integrated SACFA (Standing Advisory Committee on Frequency Allocation) module. After SACFA is cleared (it happens in auto mode), the applicant uploads invoice etc. and operating licence is generated online.”*

- 1.3 The Authority also consulted the Airport Authority of India (AAI), Directorate General of Civil Aviation (DGCA) and the providers of data communication services between aircraft and ground stations (viz. M/s SITA and M/s Bird consultancy Services Limited). The purpose of this preliminary consultation was to understand the nature and importance of the services being provided by these operators.

## **B. Background**

- 1.4 Initially, all communication between the pilot and crew in the aircraft with the ground station staff was performed using voice communication in HF<sup>2</sup> and VHF bands. In 1978, a data communication system viz. 'Aircraft Communication Addressing and Reporting System' (ACARS) was developed by Aeronautical Radio, Incorporated (ARINC<sup>3</sup>) in order to reduce crew workload and improve overall accuracy, consistency, and completeness of the data. ACARS is a digital datalink system for the transmission of short messages between aircraft and ground stations using VHF radios or satellite systems.
- 1.5 In 1991, the term VHF Digital Link was adopted by the International Civil Aviation Organization (ICAO) to refer to digital communications carried on the Aeronautical VHF band.

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<sup>2</sup> HF is an acronym of Very High Frequency. HF is the designation for the range of radio frequency electromagnetic waves (radio waves) from 3 MHz to 30 MHz.

<sup>3</sup> ARINC is now part of Collins Aerospace (In India served by 'Bird Consultancy Services').



- 1.6 ICAO is a specialized agency of the United Nations formed with a mission to support and enable a global air transport network. ICAO establishes and maintains international Standards and Recommended Practices (SARPs), as well as Procedures for Air Navigation Service (PANS). ICAO provides governments with the best results and advice possible, as they collectively and diplomatically establish new international standards and recommended practices for civil aviation internationally. India is a council member state of ICAO. ICAO works in close cooperation with other members of the United Nations family such as the International Telecommunication Union (ITU), the World Meteorological Organization (WMO), the Universal Postal Union, the World Health Organization (WHO), and the International Maritime Organization (IMO).
- 1.7 The VHF data link between aircraft and ground stations is used to obtain information from aircraft through ACARS system. The VHF data link service consists of data such as position reports, weather updates, engine health messages, etc. The ACARS-based VHF data link can be beneficial to track aircraft on a real-time basis and help investigations, search and rescue operations in case of unfortunate event of an aviation disaster.
- 1.8 Shortly after the disappearance of Malaysia Airlines flight MH370 on 08.03.2014, ICAO convened a meeting and proposed recommendations for future actions. One of the main decisions taken was the need for operators to pursue global tracking of airline flights at a faster pace. ICAO announced in 2015 that flight tracking is to be mandated, requiring all airlines to install tracking technology for aircraft regarding the Air Navigation Service Provider (ANSP) ability to obtain aircraft position reports at 15-minute intervals or less<sup>4</sup>.
- 1.9 At present, the frequency band 117.975–137 MHz is allocated on a primary basis by the International Telecommunication Union (ITU) to Aeronautical

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<sup>4</sup> <https://www.icao.int/safety/globaltracking/Pages/Homepage.aspx>

mobile (R) service and is used for air-ground, ground-air and air-air systems, providing critical voice and data communications for air traffic management and airline operational control on a global basis.

- 1.10 As per the National Frequency Allocation Plan-2022 (NFAP-2022), issued by the Wireless Planning and Coordination (WPC) Wing of the Department of Telecommunications, Government of India on 26.10.2022, the frequency band 117.975-137 MHz is allocated for Aeronautical Mobile (R) service. This allocation is subject to the provisions of Annex 10 to the Convention on International Civil Aviation and the Standards and Recommended Practices of the ICAO.

### **C. The present Consultation Paper**

- 1.11 In the above background, the Authority is issuing this Consultation Paper for soliciting comments of stakeholders on a suitable regulatory regime for data communication services between aircraft and ground stations provided by organizations other than the Airport Authority of India. For drafting this Consultation Paper, various documents, available in the public domain, published by the government agencies/ departments, telecom regulators in many countries, research agencies/ institutions, academic institutions, operators etc. were referred. Excerpts from certain documents, which have domain relevance, have been included in this Consultation Paper, wherever necessary.
- 1.12 The Consultation Paper is divided into four chapters. This Chapter deals with the Introduction and Background of the Consultation Paper. Chapter II examines the issues. Chapter III provides an overview of international practices on the subject matter. Chapter IV summarizes the issues for consultation.

## **CHAPTER II**

### **EXAMINATION OF ISSUES**

#### **A. About VHF**

2.1 Very High Frequency (VHF) is the ITU<sup>5</sup> designation for the range of radio frequency electromagnetic waves (radio waves) from 30 MHz to 300 MHz. Owing to its propagation characteristics, VHF provides good line-of sight coverage. An aircraft fitted with radio equipment operating in the VHF band can communicate with the radio equipment installed on ground station in 'line-of-sight' coverage. The typical range covered by VHF is 200 to 250 nautical miles (1 Nautical mile = 1.852 Kilometer). As mentioned in the previous chapter, ITU has reserved VHF spectrum in the frequency range (117.975 MHz to 137 MHz) for Aeronautical Mobile (R) service.

#### **B. Data communication between aircraft and ground stations using VHF**

2.2 After the introduction of ACARS in 1978, airline operators started using data communication between aircraft and ground stations via VHF radio waves and sometimes with satellite systems. At present, the data communication service between aircraft and ground stations is being used for tracking aircraft for safety of flights apart from various other usages. The following diagram depicts a network diagram of data communication service between aircraft and ground stations by using VHF radio equipment and satellite system.

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<sup>5</sup> The International Telecommunication Union (ITU) is the United Nations specialized agency for information and communication technologies – ICTs.

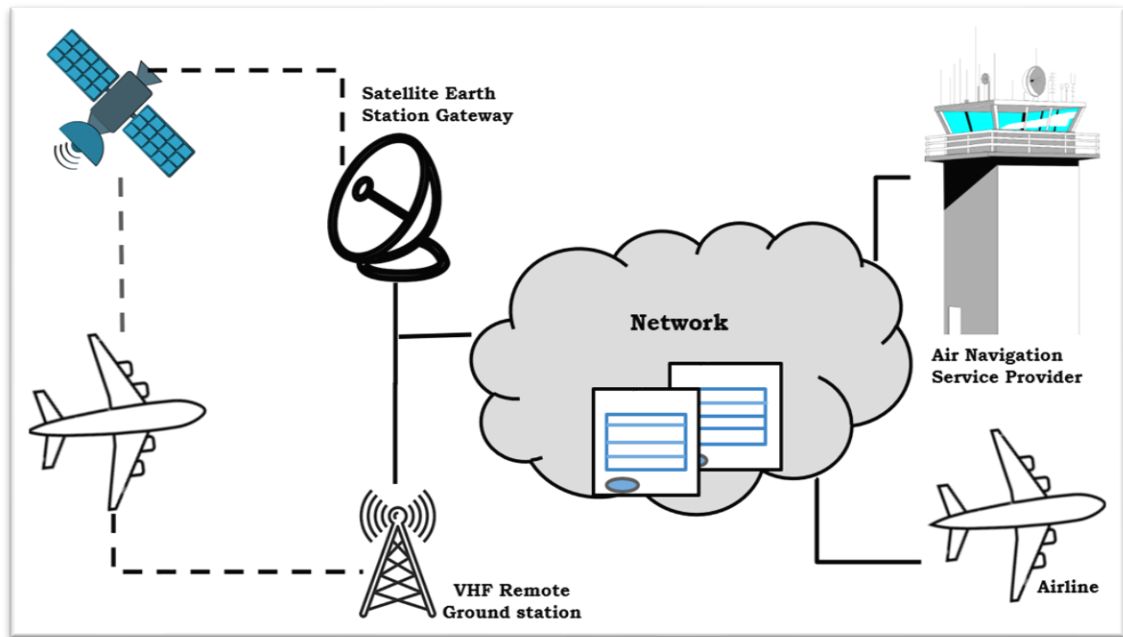


Figure 2.1: Network Diagram of data communication service from aircraft to ground stations

**C. Providers of data communication service between aircraft and ground stations**

2.3 Globally, there are two entities which provide data communications services between aircraft and ground stations:

- (a) M/s Société International de Télécommunications Aéronautique (SITA)<sup>6</sup>
- (b) M/s Collins Aerospace<sup>7</sup> (earlier ARINC) (In India served by 'M/s Bird Consultancy Services')

**D. Users of data communication service between aircraft and ground stations**

2.4 Air Navigation Service Provider (ANSP) and airline operators make use of the data communication services between aircraft and ground stations provided by

<sup>6</sup> <https://www.sita.aero/about-us/>

<sup>7</sup> <https://www.collinsaerospace.com/who-we-are/about-us>

M/s SITA, and M/s Bird Consultancy Services. A brief description of these users is given below:

**(1) ANSP**

2.5 Airport Authority of India (AAI)<sup>8</sup>, a statutory body under the Ministry of Civil Aviation, Government of India, is the sole Air Navigation Service Provider (ANSP) in India. AAI is responsible for creating, upgrading, maintaining, and managing the civil aviation infrastructure in India. As per the AAI's Annual Report of 2020-21<sup>9</sup>, AAI manages 136 airports, which include 24 International Airports, 81 Domestic Airports, 21 Civil Enclaves at Defence airfields and 10 Custom airports. AAI also provides Air Traffic Management Services (ATMS) over entire Indian Air Space and adjoining oceanic areas with ground installations at all Airports to ensure safety of Aircraft operations. AAI also has ground installations at all airports.

2.6 AAI provides the Air Traffic Services over the Indian airspace and adjoining oceanic areas in accordance with the ICAO Standards and Recommended Practices. For Air Traffic Control (ATC) purposes, AAI uses mainly VHF-based voice communication between ground stations and aircraft. For this purpose, AAI obtains VHF spectrum in Aeronautical Mobile (R) band from the WPC Wing of DoT. AAI also uses data communication services between aircraft and ground stations for ATC messaging. The primary purpose of ATC is to prevent collisions, organize and expedite the flow of air traffic, and provide information and other support for pilots. As per the information provided by AAI, at present, it is using data communication services between aircraft and ground stations at Delhi, Mumbai, Chennai, Kolkata, Hyderabad, and Bengaluru Airports.

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<sup>8</sup> <https://www.aai.aero/en>

<sup>9</sup> <https://www.aai.aero/en/business-opportunities/investors-annual-reports>

## **(2) Airline operators**

2.7 For Airline Operational Control (AOC), the airline operators make use of data communication service between aircraft and ground stations through ACARS system. This service is used mainly for the following applications:

- (a) Detecting OOOI events: ACARS system automatically detects and reports changes to the flight phases viz. Out of the gate, Off the ground, On the ground, and Into the gate (OOOI).
- (b) FMS interface: ACARS interfaces with flight management systems (FMS) for communication of flight plans and weather information from the ground station, which enables the airline to update the FMS during flight and allows the flight crew to examine new weather conditions or alternative flight plans.
- (c) Equipment health and maintenance data: ACARS is used to transmit information in real-time from the aircraft to ground stations about the conditions of various aircraft systems and sensors including maintenance faults and abnormal events for health monitoring of equipment and better planning of repairs and maintenance related tasks.
- (d) Automated ping messages: Automated ping messages are used to test aircraft connection with the communication station. A ping response indicates a healthy ACARS communication. In the event of aircraft ACARS unit being silent for a longer than a preset time interval, the ground station can ping the aircraft (directly or via satellite).

## **E. Directorate General of Civil Aviation (DGCA)**

2.8 The Directorate General of Civil Aviation is the regulatory body in the field of Civil Aviation primarily dealing with safety issues. It is responsible for regulation of air transport services to/ from/ within India and for enforcement of civil air regulations, air safety and airworthiness standards. It also co-ordinates all regulatory functions with International Civil Aviation Organisation. DGCA also issues Civil Aviation Requirements (CAR).

2.9 Through Air Safety Circular 04 of 2014 dated 05.05.2014 on the subject- "ACARS and its continuous operation during flight", DGCA issued the following instructions to all scheduled/ non-scheduled operators:

*"3.1 In view of difficulties faced in the search and rescue, after an aircraft goes missing or meets with an accident, all operators operating commercial flights are required to ensure the following:*

- a) Operators should use all suitable means to track all its aircraft engaged in the carriage of passengers/cargo from departure (Chocks-off) to arrival (Chocks-on) so as to ensure real time tracking.*
- b) Aircraft wherein the ACARS system is not available/ disabled, operator must ensure real time flight tracking using Automatic Dependent Surveillance – Broadcast (ADS-B).*
- c) Operators must ensure that ACARS/ ADS-B are fully functional before every departure.*
- d) Strict instructions should be given to the flight crew not to switch it off during the flight.*
- e) Areas where there is no coverage of ACARS/ ADS-B, operator should devise a procedure for effective tracking of the aircraft. While flying over such areas, the flight crew should report the aircraft coordinates, speed and altitude at an interval of not exceeding 15 minutes.*
- f) Flight crew should immediately report to the ground station any intermittent behaviour/ unserviceability of ACARS/ ADS-B during flight either using data link or voice message.*
- g) Operators should monitor both fault and warning messages of ACARS. They should opt for this facility from their service providers."*

**F. Systems used by AAI for data communication between aircraft to ground stations**

2.10 At present, AAI makes use of data communication services between aircraft and ground stations by using the following systems:

- (a) FANS-1A at Delhi, Mumbai, Kolkata, Chennai airports; and
- (b) Pre-FANS at Delhi, Mumbai, Kolkata, Chennai, Hyderabad, Bengaluru airports.

2.11 Future Air Navigation System (FANS) is an avionics system that provides direct data communication between the pilot and the air traffic controller (ATC). FANS-1A is a later standard. A brief description of the components of FANS-1A (viz. CPDLC and ADS-C) is given below:

- (a) CPDLC: Controller Pilot Data Link Communication (CPDLC) is the text-messaging component of FANS-1A. It provides aircraft position reports and clearance requests to ground control.
- (b) ADS-C: Automatic Dependent Surveillance-Contract (ADS-C) sends information (aircraft position, altitude, speed, and meteorological data) automatically to ATC from the aircraft when ATC has requested it.

2.12 The “pre-FANS” phase of the FANS project is aimed at the upgrade of the aircraft architecture in order to offer flexibility for the installation of Airline/ Aeronautical Operational Control (AOC) applications and provision for hosting ATC applications. A brief description of the components of pre-FANS (viz. DCL, D-ATIS and D-VOLMET) is given below:

- (a) DCL: Using Departure Clearance Downlink (DCL), the pilot sends a Request for Departure Clearance Downlink (RCD) and receives a Departure Clearance Uplink (CLD) from ATC.
- (b) D-ATIS: Datalink Automatic Terminal Information Services (D-ATIS) messages contain operational information required by aircraft before take-off and landing such as runway in use, current weather, and airport, and facility conditions.
- (c) D-VOLMET: The D-VOLMET service enables the delivery of the VOLMET information to the cockpit in the text format through the transmission of VOLMET information via data link.



2.13 The following diagram depicts the Architecture of FANS services deployed by AAI.

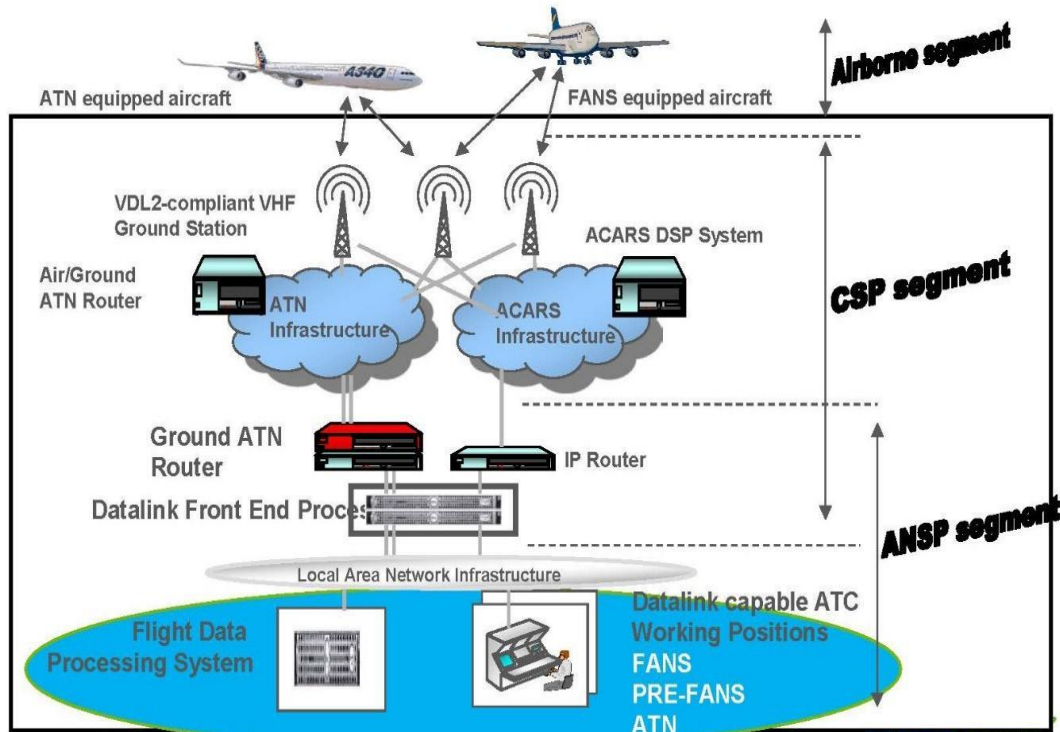


Figure 2.2: Architecture of FANS services  
[Source: Airports Authority of India]

- 2.14 The architecture used for FANS services consists of the following segments:
- Airborne Segment:** It consists of FANS equipped aircraft, which avail services from ANSP (viz. AAI in India) and the communication service providers<sup>10</sup> (CSPs).
  - CSP Segment:** It consists of air to ground datalink infrastructure (ACARS) through CSP.
  - ANSP Segment:** By using FANS system, ANSP (viz. AAI in India) provides Air Navigation Services (ANS) over the designated Indian airspace and adjoining oceanic airspace for purposes relating to the safety, regulation, and efficiency of air navigation.

<sup>10</sup> The term communication service providers (CSP) is used for the entities which provide data communication services between aircraft and ground stations (e.g. M/s SITA and M/s Collins Aerospace (in India served by M/s Bird Consultancy Services)).

**G. Data communication network for providing services between aircraft and ground stations using spectrum in aeronautical VHF band**

2.15 As mentioned in the preceding sections, VHF spectrum is useful for line-of-sight communication. A VHF radio equipment, installed by a communication service provider (such as M/s SITA and M/s Bird Consultancy Services) at a ground station can establish data link with aircrafts, which are in its line-of-sight. Thereby, using the VHF-based radio network of the communication service providers, ANSPs and airlines can communicate between ground stations to aircrafts which are within 200 to 250 nautical miles distance. The following figure depicts this aspect.

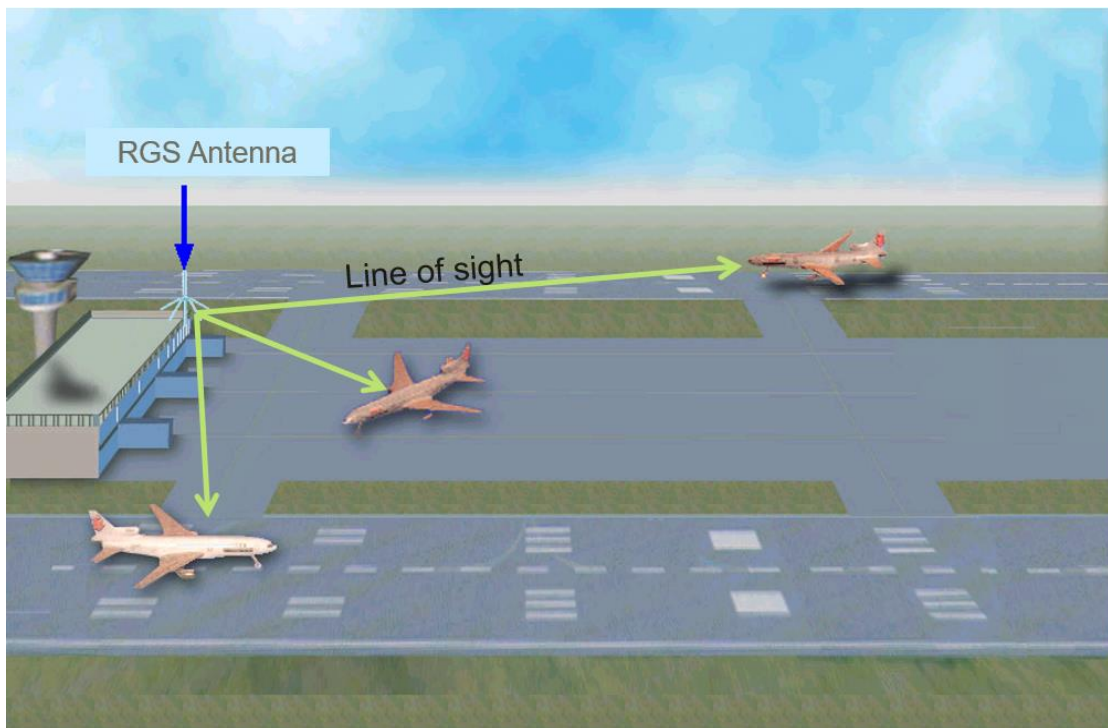


Figure 2.3: Coverage of VHF-based communication system

**H. Allocation of radio frequency spectrum for VHF-based data communication services between aircraft and ground stations**

2.16 At the national level, the Wireless Planning and Coordination (WPC) Wing of Department of Telecommunications (DoT), Ministry of Communications, is the

nodal agency of the Government of India for planning, regulation, and management of radio frequency (RF) spectrum. WPC Wing issues National Frequency Allocation Plan (NFAP) of India. It identifies which frequency bands are available for cellular mobile service, Wi-Fi, sound and television broadcasting, radionavigation for aircrafts and ships, defense and security communications, disaster relief and emergency communications, satellite communications and satellite-broadcasting, amateur service etc.

- 2.17 On 26.10.2022, WPC Wing of DoT released National Frequency Allocation Plan-2022 (NFAP-2022). As per the NFAP-2022, the frequency band 117.975-137 MHz is allocated for Aeronautical Mobile (R) service. This allocation is subject to the provisions of Annex 10 to the Convention on International Civil Aviation and the Standards and Recommended Practices of the ICAO.
- 2.18 NFAP governs the use of spectrum in India. However, it does not by itself provide the right to use the spectrum. Before any part of the spectrum is used in India, Wireless Operating License (WOL) is required to be obtained from the WPC Wing of DoT, unless such a requirement has been exempted by the Government.
- 2.19 As per the present practice, the entities desirous of providing VHF-based data communication services between aircraft and ground stations, apply for grant of WOL from the WPC Wing for using the VHF spectrum in the frequency band 117.975-137 MHz at a particular ground station. WPC Wing grants frequency spectrum to the applicant based on the bandwidth emission requirement of the radio equipment to be installed by the applicant at a ground station. At present the bandwidth emission requirements of the radio equipment installed by M/s Bird Consultancy Services and M/s SITA range from 6 KHz to 13 KHz per station.
- 2.20 The process of application for grant of WOL for data communication services between aircraft and ground station is indicated below:

- (a) The process of grant of WOL is through the online portal [www.saralsanchar.gov.in](http://www.saralsanchar.gov.in).
- (b) The applicant is required to submit the prescribed application form with all the supporting documents including details of the applicant, radio station details with geo-coordinates, antenna details, power output, emission bandwidth, and technical literature of all the equipment to be deployed etc. A separate WOL is required to be obtained for each station. The applicant needs to submit separate applications for each station.
- (c) After the first level of scrutiny of the application filed, WPC sends a request to AAI for the purpose of frequency coordination of the wireless station to be installed at the airport. The Application is processed at the WPC Wing only after receiving a confirmation from AAI.
- (d) Once the AAI comments are received in the affirmative, a Letter-of-Intent (LoI) is generated with 60 days validity. The LOI specifies the amount to be paid by the applicant to the Government as annual royalty charges.
- (e) A "Letter of Undertaking" is also required to be submitted by the applicant and payment is to be made through Challan through "https://bharatkosh.gov.in".
- (f) On receipt of the demanded payment online as per the LOI, a Decision Letter (DL) is generated. The DL indicates the permitted frequency etc. The DL permits the applicant to procure the radio equipment either from the domestic market or import it from any foreign country. With the generation of DL, the application is forwarded to integrated Standing Advisory Committee on Frequency Allocation (SACFA) module. After clearance of SACFA, the applicant uploads invoice etc. on the [www.saralsanchar.gov.in](http://www.saralsanchar.gov.in) portal.
- (g) On submission of the commercial invoice copy of the procurement of the radio equipment, equipment technical specifications, and valid Dealers Possession License (DPL) to WPC, WOL is issued to the applicant by the WPC wing through the saralsanchar portal.

2.21 The afore-mentioned process for grant of WOL has been summarized in the following flowchart:

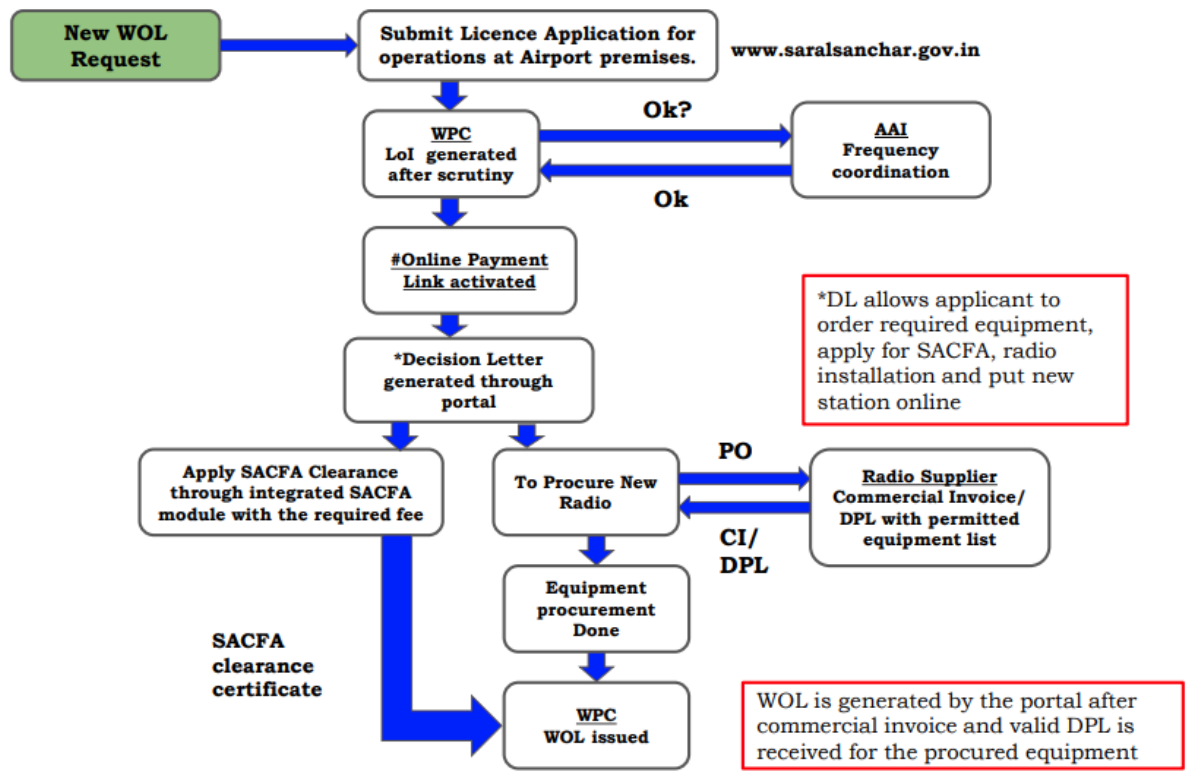


Figure 2.4: Process for grant of Wireless Operating License (WOL) by the WPC Wing

**I. Need for a service license for provision of data communication services between aircraft and ground stations**

2.22 As mentioned before, through the reference dated 12.04.2022, DoT stated, *inter-alia*, as below:

"2. During 2012, M/s BCS; and during 2014-2015 and 2021, M/s SITA; applied to this Ministry to add More stations to their network. M/s SITA applied for 15 additional locations and M/s BCS applied for 10 additional airports in the country (Annexure-6).

3. While processing the applications for additional locations, a concern was raised that the operations by both M/s SITA and M/s BCS were not captive

*(internal use) in nature, and there could have a commercial angle in the operation that involved a service rendered to airlines operators. A further concern was whether such services, being offered in a sensitive area as civil aviation, should be regulated under any "service license". ..."*

2.23 Further, through the afore-mentioned reference dated 12.04.2022, DoT requested, *inter-alia*, to provide recommendations on an appropriate mechanism to regulate the data communication services between aircraft and ground stations.

2.24 For the purpose of understanding, the use of frequency spectrum by various entities can be classified into two broad categories; namely, captive and non-captive. These two categories can further be classified into captive (public, and non-public) and non-captive (public, and non-public). For this purpose, the following definitions can be used:

- (a) The term 'captive' means the use of spectrum by the assignee entity to meet its internal communication needs.
- (b) The term 'non-captive' means the use of spectrum by the assignee entity to provide services to others.
- (c) The term 'public' means use of spectrum by the assignee entity for providing services to the public.
- (d) The term 'non-public' means use of spectrum by the assignee entity not to the public.

2.25 Based on the above framework, the use of frequency spectrum could be classified in terms of the following matrix. For indicative purposes, a candidate service has been mentioned in the respective quadrants of the matrix.

<b>Type of classification</b>	<b>non-public</b>	<b>public</b>
<b>non-captive</b>	Data communication services between aircraft and ground stations	Access services
<b>captive</b>	Captive Non-public network (CNPN)	-

Table 2.1: Classification of users of radio frequency spectrum

- 2.26 From the above matrix, data communication services between aircraft and ground stations may be classified as non-captive, non-public; non-captive because the frequency spectrum is not consumed for internal use, but to provide services to other users; non-public because this service is not made available to the public but to a select few organizations (AAI and Airlines). The said service is not a part of any public communication service such PSTN<sup>11</sup>, PLMN<sup>12</sup> etc.
- 2.27 It is worth mentioning that on 27.06.2022, DoT issued 'Guidelines for Captive Non-Public Network (CNPN) License'. Through these guidelines, DoT decided, *inter-alia*, to enable enterprises to establish CNPNs in India. An entity will have to obtain CNPN License from the Government for this purpose. A CNPN licensee may obtain frequency spectrum directly from the Government and establish its own isolated network. On 20.10.2022, DoT released a sample copy of the CNPN License Agreement on its web-site. As the Government has brought the establishment, maintenance, and working of Captive Non-Public Network (CNPN) under a licensing regime, the proposition to regulate data communication services between aircraft and ground stations under service license merits consideration.

<sup>11</sup> PSTN is an acronym of Public Switched Telephone Network.

<sup>12</sup> PLMN is an acronym of Public Land Mobile Network.

2.28 At present, generally, the non-captive communication services are being regulated through Unified License. On the other hand, captive network-based services (such as CNPN and Captive Mobile Radio Trunking Service<sup>13</sup>) are being regulated through relatively lighter licensing regimes.

2.29 In this background, the Authority solicits inputs of stakeholders on the following sets of questions:

**Issues for consultation:**

**Q1. Whether there is a need to bring data communication services between aircraft and ground stations provided by organizations other than Airport Authority of India under service licensing regime? Kindly provide a detailed response with justification.**

**Q2. In case your answer to Q1 is in the affirmative, should the providers of data communication services between aircraft and ground stations be licensed through –**

**(a) an authorization under Unified License; or**

**(b) a separate service license.**

**Kindly provide a detailed response with justification.**

**J. Specifications of the license**

2.30 Currently, WOL is issued to the providers of data communication services between aircraft and ground stations for a period of one year at each location. The renewal of the WOL is not done automatically. It needs to be obtained every year through a similar process for each station.

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<sup>13</sup> In respect of Captive Mobile Radio Trunking Service, DoT grants a separate license namely 'License Agreement for Provision of Captive Mobile Radio Trunking Service (CMRTS)'.



- 2.31 At present, the telecommunication service licenses have a much longer period of validity. For instance, the period of validity of Unified License (UL) is 20 years, while the period of validity of CNPN license is 10 years. One may contend that as the data communication services between aircraft and ground stations have an element of air passenger safety associated with it, the period of validity of the license for providing such services should be sufficiently long.
- 2.32 The licensing framework for any service requires defining the licensed area of the service, scope of the service and various obligations under the license. For this purpose, the technical, operating, security, and financial conditions (such as processing fee, entry fee, license fee, bank guarantees, etc.) need to be defined.
- 2.33 In this background, the Authority solicits inputs of stakeholders on the following question:

**Issue for consultation:**

- Q3. What should be the broad terms and conditions of the licensing framework for data communication services between aircraft and ground stations, such as –**
- (a) licensed service area,**
  - (b) validity period of the license,**
  - (c) scope of the license,**
  - (d) technical conditions,**
  - (e) operating conditions,**
  - (f) security conditions, and**
  - (g) financial conditions (such as application processing fee, entry fee, license fee, bank guarantees, etc.)?**

**Kindly provide a detailed response with justification.**

## **K. Methodology for Spectrum Assignment**

- 2.34 Through the reference dated 12.04.2022, DoT requested, *inter-alia*, to provide recommendations on "[t]he manner in which the frequency assignment should be made to these organizations, in light of the supreme Court judgment made in the 2G case in 2012 - to assign radio frequencies only through auction".
- 2.35 After the Hon'ble Supreme Court's judgement dated 02.02.2012 in the 2G case, DoT has been assigning 'mobile access spectrum' to TSPs based on spectrum auctions held from time to time. Also, on the specific condition that such assignment shall not be treated as final, but purely interim and provisional, subject to Government's final decision on allotment and pricing of spectrum, DoT has been assigning frequency spectrum to captive users including government users on administrative basis. Thus, for a few services (e.g. CMRTS, VSAT-CUG service etc.), frequency spectrum is being assigned through an administrative process. In 2021, the Government assigned 5 MHz (paired) spectrum in the 700 MHz band to Indian Railways for their LTE technology-based network on administrative basis.
- 2.36 The matter relating to assignment of frequency spectrum to the providers of data communication services between aircraft and ground stations requires to be seen in light of the following facts:
- (a) In the National Frequency Allocation Plan (NFAP), WPC Wing of DoT has allocated the frequency band 117.975-137 MHz for Aeronautical Mobile (R) service.
  - (b) At present, two entities viz. M/s SITA and M/s Bird Consultancy Services provide data communication services between aircraft and ground stations using the spectrum in the frequency range 117.975-137 MHz.
  - (c) In the past, the WPC Wing has assigned spectrum in the frequency range 117.975-137 MHz to applicants based on the bandwidth emission requirement of the radio equipment to be installed by the applicants at ground station.

2.37 In this background, the Authority solicits comments of stakeholders on the following question:

**Issue for consultation:**

**Q4. What should be the methodology for assignment of the spectrum in frequency range 117.975-137 MHz to the providers of data communication services between aircraft and ground stations? Should the spectrum be assigned administratively, or through auction, or through any other method? Kindly provide a detailed response with justification.**

**L. Spectrum charging mechanism**

2.38 At present, charges for the frequency spectrum assigned to M/s SITA and M/s Bird Consultancy Services are levied as per the DoT's order dated 22.03.2012 on the subject- "Royalty charges for Assignment of Frequencies to 'Captive Users' (users being charged on formula basis) including all Government Users, involving Single Channel Operations for Fixed/ Land/ Land Mobile Stations/ terrestrial Broadcasting". Through the reference dated 12.04.2022, DoT stated, *inter-alia*, that "[w]hile processing the applications for additional locations, a concern was raised that the operations by both M/s SITA and M/s BCS were not captive (internal use) in nature, and there could have a commercial angle in the operation that involved a service rendered to airlines operators."

2.39 It is seen that the services provided by M/s SITA and M/s Bird Consultancy Services are, *prima facie*, non-captive in nature as these services are not for their internal use. However, at present, the annual royalty charges are levied on them according to DoT's order for "Royalty charges for Assignment of Frequencies to 'Captive Users' (users being charged on formula basis) including

all Government Users, involving Single Channel Operations for Fixed/ Land/ Land Mobile Stations/ terrestrial Broadcasting” after obtaining an undertaking from them that the allotment of spectrum is provisional and subject to the Governments’ decision on allotment and pricing of spectrum, and that the revised spectrum charges, as finally determined through market related mechanism or otherwise, as may be applicable, shall be paid by them from the date of Letter of Intent (LoI) for provisional allotment of spectrum.

- 2.40 In accordance to the DoT’s order No. P-11014/34/2009-PP (I) dated 22.03.2012 on the subject - “Royalty Charges for assignments of frequencies to captive users (users being charged on formula basis) including all government users, involving single channel operations for Fixed/ Land/ Land Mobile Stations/ terrestrial Broadcasting”, the Annual Royalty per carrier (in Rs.) is given by the following formula:

$$\text{Annual Royalty Charge per carrier (in Rs.)} = M \text{ multiplied by } W$$

Where:

- (a) M is the ‘Basic Royalty’ per carrier in a basic link, and
- (b) W is the ‘bandwidth factor’.

- 2.41 For computation of annual royalty charges, the afore-mentioned order dated 22.03.2012 provides, *inter-alia*, as below:

- (a) Minimum channel bandwidth for charging purpose is 12.5 KHz.
- (b) For the purpose of charging royalty, the bandwidth factor W is computed in terms of a unit channel bandwidth of 12.5 KHz (equivalent voice channel) as below:

$$W = [\text{Actual channel bandwidth (in KHz)} \text{ divided by } 12.5] \text{ rounded to next higher integer}$$

(c) A look-up table (which is applicable for single channel bandwidths upto 375 KHz) provides that the Basic Royalty (in Rs.) per carrier of the basic link per carrier for maximum distance greater than 500 Km is 50,000.

2.42 As mentioned above, at present, the bandwidth emission requirement of the aeronautical VHF radio equipment installed by M/s Bird Consultancy Services and M/s SITA is either 6 KHz or 13 KHz per station.

2.43 Based on the above formula, Annual Royalty Charge per carrier for a basic link of channel bandwidth 13 KHz covering a distance greater than 500 kilometer may be calculated as below:

Annual Royalty Charge (in Rs.) = Roundup (13/12.5) * 50,000 = 2 * 50,0000 = 1,00,000
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2.44 Apart from the Annual Royalty Charges, a License Fee of Rs. 500 per Fixed Station is also payable in terms of the DoT's order No. P-11014/34/2009-PP (IV) dated 22.03.2012 on the subject- "License fee and other fees, Surcharge/ late fee and Charging methodologies for Royalty/ license fees for 'Captive Users' (users being charged on formula basis) including all Government Users".

2.45 Accordingly, the total WPC charges per station per year for a carrier having channel bandwidth of 13 KHz covering a distance greater than 500 kilometer may be calculated as below:

Total WPC charges per station per year  
= Annual Royalty Charge *plus* License Fee  
= Rs. 100,000 + Rs. 500  
= Rs. 100,500

2.46 During TRAI's preliminary consultation with the providers of data communications services between aircraft and ground stations (viz. M/s SITA and M/s Bird Consultancy Services), they informed that the spectrum allotment and license fee charged on a formula basis, by DoT is not final and is on a provisional basis. They have also intimated that they have to submit an undertaking to DoT, according to which, in case the allotment method and charging mechanism changes later, they may have to pay the charges based on the market-related method or otherwise, from the date of the letter of intent (LOI).

2.47 At present, DoT levies spectrum charges based on the following three different methods:

- (a) Market discovered price in spectrum auctions, which are held from time to time;
- (b) On formula basis in terms of the orders dated 22.03.2012 issued by DoT; and
- (c) As a percentage of Adjusted Gross Revenue (AGR) of the licensee company.

2.48 The following table enumerates the methods used by DoT for levying spectrum charges on service licensees:

<b>S. No.</b>	<b>Method of assignment of spectrum</b>	<b>Method for levying spectrum charges</b>	<b>Example of services for which spectrum charges are levied using the applicable method</b>
1	Auction process	Market discovered price in auction <sup>14</sup>	Access service
2	Administrative process	On formula basis	CMRTS
3		As a percentage of AGR	Commercial VSAT-CUG Service

Table 2.2: Methods used by DoT for levying spectrum charges on service licensees

2.49 With respect to the above table, in the case of Commercial VSAT-CUG service, the DoT levies spectrum charges equivalent to three to four percent (3-4%) of AGR based on data rate. However, the assignment and charging of spectrum are subject to an undertaking submitted by the licensee as discussed in the preceding section.

2.50 The Authority examined the approaches being used by DoT for charging of spectrum viz. (a) allocation through administrative process, and (b) allocation through auction process. In case, the frequency spectrum in the 117.975-137 MHz (earmarked for Aeronautical Mobile (R) service in India) is auctioned, the providers of data communication services between aircraft and ground station will be required to bid for the frequency spectrum in the auction. However, for any bidding procedure, the reserve price which acts as a lower bound for the

<sup>14</sup> In respect of access spectrum, apart from market discovered price in auction, DoT also levies spectrum usage charges (SUC) as a percentage of AGR. However, vide OM No: L-14047/08/2021-NTG dated 08.10.2021, as part of the reforms for the telecommunication sector, DoT has decided that “[f]or spectrum acquired in future auctions, no Spectrum Usage Charge (SUC) will be levied”. Source: <https://dot.gov.in/sites/default/files/2021-10-08%20-%20OM%20regarding%20Spectrum%20reforms.pdf>

bids must be set. The setting of reserve price is dependent upon certain valuation approaches used by the Authority.

- 2.51 In the past, the Authority has made use of various methodologies/ approaches for the purpose of valuation and fixation of reserve prices. These methodologies/ approaches rely on an extensive dataset as per the market and parameters related to a frequency band, spectrum holdings etc. In case, the frequency spectrum for data communications services between aircraft and ground stations is put to auction in India, such auction will be the first for such frequency spectrum (117.975-137 MHz). There is no historical auction data available to conduct comparative analysis involving auction determined prices in India or using valuation models involving data related to the relevant spectrum band (117.975 -137 MHz). Therefore, alternative approaches for valuation of spectrum in this band would be required to be explored. These approaches could be based on comparative values that can be achieved by using relative technical efficiency factor of some other spectrum bands. The possibility of using relevant international data or practices in this regard may also be explored.
- 2.52 In view of the above, the Authority solicits comments of stakeholders on the following set of questions:

**Issues for consultation:**

**Q5. In case administrative assignment is to be followed, what should be the mechanism for charging the VHF spectrum in the frequency range 117.975-137 MHz to be assigned to the providers of data communication services between aircraft and ground? Whether the auction determined prices for other frequency bands can be accounted for estimating the value of VHF spectrum in the frequency range 117.975-137 MHz? Kindly provide a detailed response with justification.**



- Q6. If auction methodology is to be followed, whether the valuation of VHF spectrum in frequency range 117.975-137 MHz assigned to the providers of data communication services between aircraft and ground stations should be derived by relating it to the valuation of other frequency bands by using technical efficiency factor? If yes, with which frequency band, should these frequencies be related to and what efficiency factor or formula should be used for estimating the value of VHF spectrum in frequency range 117.975-137 MHz? Kindly justify your suggestions.**
- Q7. What are the prevalent international practices being followed in other countries for assignment and charging (including other applicable charges and fees) of spectrum in the frequency range 117.975-137 MHz, which is used for providing data communication services between aircraft and ground stations? Please provide a detailed response.**
- Q8. Whether the valuation of VHF spectrum assigned to the providers of data communication services between aircraft and ground stations be derived using the methodologies used internationally in this regard? If yes, which of the methodologies can be followed? Please provide a detailed response.**
- Q9. Apart from the approaches highlighted above, which other valuation approaches should be adopted for valuation of the VHF spectrum in the frequency range 117.975-137 MHz? Kindly support your suggestions with detailed methodologies, related assumptions, and other relevant factors.**

**Q10. Whether there are any other issues/ suggestions relevant to the subject? The same may be submitted with proper explanation and justification.**

2.53 The following chapter provides an overview of international practices on the subject matter.

## **CHAPTER III**

### **INTERNATIONAL PRACTICES**

3.1 The regulatory practices in respect of data communication services between aircraft and ground stations followed in some countries are outlined below:

#### **A. The United States of America (USA)**

3.2 The Federal Communications Commission (FCC) regulates Aviation Services in cooperation with the Federal Aviation Administration (FAA). Wherever aviation services are provided in U.S. territory, both FAA and FCC requirements must be met by anyone who uses aviation radio. In addition, civil aircraft on international flights are subject to international radio regulations intended to safeguard air travelers worldwide. Flight safety is the primary purpose of all Aviation Services.

3.3 Ground Radio Stations<sup>15</sup> are usually of the following types:

- (a) The Aeronautical and Fixed Service includes stations used for ground-to-air communications with aircraft about aviation safety, navigation, or preparation for flight.
- (b) The Aeronautical Radionavigation Service is made up of stations used for navigation, obstruction warning, instrument landing, and measurement of altitude and range.

3.4 Ground station authorizations are usually only issued to aviation service organizations located in airports, businesses engaged in pilot training, aircraft

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<sup>15</sup> <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/aviation-radio-services>

manufacturers, or persons engaged in chase activities related to soaring and ballooning<sup>16</sup>.

## **B. United Kingdom (UK)<sup>17</sup>**

3.5 Aeronautical radio is divided into two main functions – aircraft and ground stations (including both voice and radio navigation). The communication regulator (OFCOM) issues a license to authorize these uses of radio.

3.6 The aircraft radio license covers the aircraft for all aeronautical radio equipment it carries. It lists and permits the main equipment types used on aircraft. This includes the following:

- (a) VHF communication operating between 117.975 and 137 MHz: Very High-Frequency Communication and Navigation – Equipment installed onto aircraft for these purposes; and
- (b) VHF portable operating between 117.975 and 137 MHz: Portable VHF radios for use in aircraft.

3.7 On the other hand, the aeronautical ground station licenses authorize the installation and use of radio installations that provide ground-to-air communication. Ground station licenses are not issued until OFCOM is satisfied that the ground station has been assessed as fit for purpose by the Civil Aviation Authority (CAA).

3.8 License Fee (Aeronautical Ground Station)<sup>18</sup>: Licenses usually cover a single site. A separate fee is payable for each assigned working frequency.

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<sup>16</sup> <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/aviation-radio-services/ground-stations#operations>

<sup>17</sup> <https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/aeronautical-licensing/licence-products>

<sup>18</sup> [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0026/55808/statement.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0026/55808/statement.pdf)

- 3.9 There are several types of ground station radio licenses to cover the main types of ground-to-air service. These include:
- (a) Aeronautical Station - ACARS: Aircraft Communications Addressing and Reporting System, a Slow speed data communication is known for operational control
  - (b) Aeronautical Station (VDL): VHF Air-Ground Digital Link, a Very High-Frequency Data Link.

### **C. Australia<sup>19</sup>**

- 3.10 In Australia, an aeronautical license allows the operation of a station for air traffic control, aerodrome radio information services, private company radio at an airport or airfield, and other airport or aerodrome services. One license covers the use of a range of equipment in one place, including fixed stations, mobile stations, hand-helds, and stations on aircraft.
- 3.11 An aeronautical license is an assigned license, that is a frequency is allocated by ACMA. All equipment must operate on the assigned frequency. Airservices Australia manages aeronautical frequencies, and they must approve an aeronautical service before a license is issued.
- 3.12 The licensee should be accredited by the Civil Aviation Safety Authority (CASA) to operate an aeronautical station. The Radiocommunications (Interpretation) Determination 2015 defines aeronautical licenses.
- 3.13 License conditions: When a licensee has an aeronautical license, they must follow the conditions of the license. These include conditions of the Radiocommunications Act 1992 (the Act), Licence Condition (Apparatus Licence) Determination 2015, Licence Conditions (Aeronautical Licence) Determination 2015, and other conditions that apply to the licensee under

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<sup>19</sup> <https://www.acma.gov.au/licences/aeronautical-licence>

'special conditions. These conditions help the licensee communicate safely and without interference.

- 3.14 Fees: ACMA charges fees for apparatus licenses. In some circumstances, the licensee can apply for a license fee exemption or concession.
- 3.15 Application Process for an aeronautical license: To apply for an aeronautical license, a license seeker should contact an accredited person. They can assign a frequency, give a frequency assignment certificate and apply for the license on behalf of the license seeker.

#### **D. New Zealand**

- 3.16 In New Zealand, aircraft licenses are used for communicating to or from aircraft or an aeronautical base station<sup>20</sup>. If radio equipment is to be operated in the aeronautical mobile bands, the type of license depends on the type of equipment and its area of operation. If the equipment is to be operated outside of New Zealand's territorial limits, an aircraft license is required to be obtained.
- 3.17 This license also covers the operation of any authorized Distance Measuring Equipment (DME), Weather Radar, ATC Transponder, Radio Altimeter, Traffic alert and Collision Avoidance System (TCAS), and SATCOM equipment on board.
- 3.18 Application for aircraft license is to be made online through Register of Radio Frequencies (RRF) and after submission of which an annual license fee is required to be paid. On the payment of the license fee, the license will be granted, entry of which will be made in the RRF and can be viewed it in the RRF.

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<sup>20</sup> <https://www.rsm.govt.nz/licensing/licences-you-must-pay-for/aircraft-licence/>

3.19 If the equipment is to be operated within New Zealand’s territorial limits only, Aeronautical Purposes General User Radio Licence (GURL)<sup>21</sup> can be used. With this license, users can own and operate radio transmitting equipment for radiocommunications in the aeronautical service without needing to pay for a license. However, for this type of license, the spectrum is shared with other users who use the same frequency and power at the same time and may cause interference in the service. The licensee is allowed to use the frequencies assigned to this GURL to operate:

- (a) aeronautical radio transmitters in the VHF band
- (b) portable radio transmitters, and
- (c) on-board aircraft transmitters for satellite communications and aeronautical radio navigation and radiodetermination purposes.

## **E. Hong Kong<sup>22</sup>**

3.20 In Hong Kong, a license is required for possession, establishment, and maintenance (or use) of a radiocommunications station. Accordingly, an Aircraft Station Licence should first be obtained from the Communications Authority, before a person maintains and uses a radiocommunications station for radiocommunications on board an aircraft registered by the Director-General of Civil Aviation.

3.21 The aircraft to be installed with the station should be registered by the Director-General of Civil Aviation. The radio apparatus of the station should be approved by the Director-General of Civil Aviation as complying with all relevant Airworthiness Requirements.

3.22 Applications should be submitted to the Office of the Communications Authority together with a duly completed application form and the required documents.

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<sup>21</sup> <https://www.rsm.govt.nz/licensing/frequencies-for-anyone/aeronautical-purposes-gurl/>

<sup>22</sup> <https://www.coms-auth.hk/filemanager/statement/en/upload/50/gn012012e.pdf>

3.23 The payment of license fee<sup>23</sup> is required to be made only after the application is approved and the frequency assignment is made.

**F. Singapore<sup>24</sup>**

3.24 Singapore adopts the FANS-1/A procedures and requirements for the use of data link applications contained in the FANS-1/A Operations Manual (FOM), which has been adopted by ICAO for Regional use.

3.25 Automatic Dependent Surveillance – Contract (ADS-C), is used wholly to provide procedural separation. The provision of air traffic services to aircraft, based on information received from aircraft via ADS-C, is generally referred to as the provision of ADS-C service.

3.26 The Controller-Pilot Data Link Communications (CPDLC) application provides a means of communication between the controller and pilot, using data link for ATC communication. This application includes a set of clearance/ information/ request message elements which correspond to the phraseologies used in the radiotelephony environment.

3.27 An aeronautical station is defined as a land station in the aeronautical mobile service. Aeronautical station operators are in-charge of communications between aircraft and air traffic controllers in oceanic areas where HF radio communications are used.

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<sup>23</sup> <https://eform.one.gov.hk/form/oca051/en/>

<sup>24</sup> [https://www.caas.gov.sg/docs/default-source/docs---srg/manual-of-standards-air-traffic-services-\(ver-3-0\)-\(final\).pdf](https://www.caas.gov.sg/docs/default-source/docs---srg/manual-of-standards-air-traffic-services-(ver-3-0)-(final).pdf)



3.28 The license fee is charged per annum per station, while the frequency fee as well as the Application and Processing Fee depend on the bandwidth of the frequencies.<sup>25</sup>

## **G. Belgium<sup>26</sup>**

3.29 All radio-equipped aircraft must have a license on board describing the equipment on board, pursuant to international regulations. Numerous onboard equipment requires authorization issued by Belgian Institute for Postal Services and Telecommunications (BIPT), including VHF radio, radar, transponder, etc. The person operating this installation is required to hold a restricted operator's certificate for an aircraft station. BIPT is in-charge of issuing these authorizations and certificates.

3.30 Ground stations also need to be covered by an authorization. The licenses for land-based communications are issued by the Private Licences Department.

## **H. Qatar<sup>27</sup>**

3.31 The applicable frequency band for air-ground and ground-air communications over VHF aeronautical band is 118 – 137 MHz. The following categories and sub-categories of Aeronautical licenses are issued in Qatar:

- (a) Aircraft Radio Station Licenses of two categories, viz. (i) Aircraft Mobile Radio station, (ii) Aircraft Transportable Radio station
- (b) Ground Based Aeronautical Station Licenses of three categories, viz. (i) Aeronautical Ground Station (AGS), (ii) Aeronautical Navigational Aids and (iii) Aeronautical Ground Based Radar

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<sup>25</sup><https://www.imda.gov.sg/~media/imda/files/regulation%20licensing%20and%20consultations/licensing/licenses/guiderctm.pdf>

<sup>26</sup><https://www.bipt.be/consumers/aeronautical>

<sup>27</sup><https://mot.gov.qa/en/file/documents/guidelines-aeronautical-radio-spectrum-licensespdf>

- 3.32 The Aeronautical Ground Station (AGS) license covers the use of aeronautical radio frequencies for ground-based aeronautical services such as general aviation; air traffic control; operations control, search and rescue and emergency communication, HF communication, and public correspondence.
- 3.33 The AGS License may be applied for by the Qatar Civil Aviation Authority (QCAA) or an authorized representative of an Aerodrome, approved by the QCAA. An applicant wishing to establish a new aeronautical ground radio station must obtain an equipment proficiency certification from the QCAA.

## **I. United Arab Emirates (UAE)<sup>28</sup>**

- 3.34 The Aircraft/ Gliders/ Balloons Radio license is a license given to an aircraft by Telecommunications and Digital Government Regulatory Authority (TDRA), UAE, to permit the operation of all radio equipment on the Aircraft/Gliders/Balloons necessary for communication, navigation and surveillance purposes. The Aircraft/Gliders/Balloons Radio License is required as a mandatory document to be carried onboard. It includes Ground to Air Communication. This License is required as a mandatory document to be carried onboard. The Aircraft/Gliders/Balloons must be registered in the UAE with the General Civil Aviation Authority (GCAA).
- 3.35 To apply for the License, the license seeker needs to fill in and submit the application for frequency spectrum authorization along with the required documents. Next, they need to pay spectrum fees through the specified payment channels in accordance with TDRA spectrum fees regulations. Finally, they can collect the frequency spectrum authorization issued by TDRA online.

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<sup>28</sup> <https://tdra.gov.ae/ar-AE/Services/service-card?SID=okBXmHjOZMHk7DTpWjXnPN25KCMyvT23Frd2AHCwZU0>

## **J. Sri Lanka**

- 3.36 There are different types of communication devices installed in the Aircraft stations and Aircraft Earth stations to ensure the safe movement of the Aircraft by providing signals or messages relating to distress, urgency, the safety of life and navigation, etc. Most of these communication devices operate on frequencies assigned for international use while individual frequency assignments are used only for ground-handling purposes. All these radio communication equipment on board or at stations must hold a valid license to operate such equipment<sup>29</sup>.
- 3.37 A license is required for the use of frequency/ frequency emitting apparatus for aeronautical service (aeronautical mobile). The application needs to include technical details such as the Radio Frequency Band (VLF/ LF/ MF/ HF/ VHF/ UHF/ SHF/ EHF), Class of Station (Fixed/ Land Mobile/ Maritime Mobile/ Aeronautical Mobile/ Broadcasting/ Others), Requested Frequency Range/ Frequencies of Operation, etc.<sup>30</sup>
- 3.38 The following chapter lists the issues for consultation.

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<sup>29</sup> <https://www.trc.gov.lk/aeronautical-services.html>

<sup>30</sup> [https://trc.gov.lk/images/stories/spectrum/AEROUNATICLE\\_MOBILE\\_Application\\_form.doc](https://trc.gov.lk/images/stories/spectrum/AEROUNATICLE_MOBILE_Application_form.doc)

**CHAPTER IV**  
**ISSUES FOR CONSULTATION**

Stakeholders are requested to provide responses to the following questions with detailed justifications:

- Q1. Whether there is a need to bring data communication services between aircraft and ground stations provided by organizations other than Airport Authority of India under service licensing regime? Kindly provide a detailed response with justification.**
- Q2. In case your answer to Q1 is in the affirmative, should the providers of data communication services between aircraft and ground stations be licensed through –**
- (a) an authorization under Unified License; or**
  - (b) a separate service license.**
- Kindly provide a detailed response with justification.**
- Q3. What should be the broad terms and conditions of the licensing framework for data communication services between aircraft and ground stations, such as –**
- (a) licensed service area,**
  - (b) validity period of the license,**
  - (c) scope of the license,**
  - (d) technical conditions,**
  - (e) operating conditions,**
  - (f) security conditions, and**
  - (g) financial conditions (such as application processing fee, entry fee, license fee, bank guarantees, etc.)?**

- Q4. What should be the methodology for assignment of the spectrum in frequency range 117.975-137 MHz to the providers of data communication services between aircraft and ground stations? Should the spectrum be assigned administratively, or through auction, or through any other method? Kindly provide a detailed response with justification.**
- Q5. In case administrative assignment is to be followed, what should be the mechanism for charging the VHF spectrum in the frequency range 117.975-137 MHz to be assigned to the providers of data communication services between aircraft and ground? Whether the auction determined prices for other frequency bands can be accounted for estimating the value of VHF spectrum in the frequency range 117.975-137 MHz? Kindly provide a detailed response with justification.**
- Q6. If auction methodology is to be followed, whether the valuation of VHF spectrum in frequency range 117.975-137 MHz assigned to the providers of data communication services between aircraft and ground stations should be derived by relating it to the valuation of other frequency bands by using technical efficiency factor? If yes, with which frequency band, should these frequencies be related to and what efficiency factor or formula should be used for estimating the value of VHF spectrum in frequency range 117.975-137 MHz? Kindly justify your suggestions.**
- Q7. What are the prevalent international practices being followed in other countries for assignment and charging (including other applicable charges and fees) of spectrum in the frequency range 117.975-137 MHz, which is used for providing data communication services between aircraft and ground stations? Please provide a detailed response.**

- Q8. Whether the valuation of VHF spectrum assigned to the providers of data communication services between aircraft and ground stations be derived using the methodologies used internationally in this regard? If yes, which of the methodologies can be followed? Please provide a detailed response.**
- Q9. Apart from the approaches highlighted above, which other valuation approaches should be adopted for valuation of the VHF spectrum in the frequency range 117.975-137 MHz? Kindly support your suggestions with detailed methodologies, related assumptions, and other relevant factors.**
- Q10. Whether there are any other issues/ suggestions relevant to the subject? The same may be submitted with proper explanation and justification.**

**ANNEXURE I**

Government of India  
Ministry of Communications  
Department of Telecommunications  
WPC Wing, 20, Asoka Road,  
Sanchar Bhawan, New Delhi-110 001

L-14021/01/2021-WF

Dated:12/04/2022

To,

The Secretary  
Telecom Regulatory Authority of India  
Mahanagar Doordarshan Bhawan,  
New Delhi.

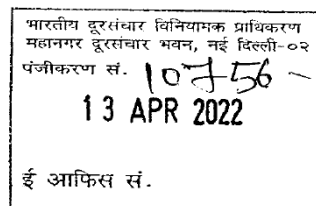
Subject : Request for TRAI recommendation for frequency assignment for Data communication services between aircraft and ground stations for services provided by organisations other than Airports Authority of India.

Sir,

During 2006-2010, this Ministry made frequency assignments to M/s *Société Internationale de Télécommunications Aéronautiques*, (SITA) and M/s Bird Consultancy Services (BCS) to operate VHF Data Communication Link between aircrafts and ground. M/s SITA was assigned 131.725 MHz and 136.975 MHz to operate at 28 airports; and M/s BCS was assigned 131.825 MHz to operate at 04 airports (List of airports attached Annexure-1). The spectrum charges were levied as per Order issued in 1987, and Corrigendum there to issued on 06/05/2003. This order was revised in 2005 and March 2012. (copy of relevant orders are attached as Annexure-2 to 5, respectively).

2. During 2012, M/s BCS; and during 2014-2015 and 2021, M/s SITA; applied to this Ministry to add More stations to their network. M/s SITA applied for 15 additional locations and M/s BCS applied for 10 additional airports in the country (Annexure-6).

3. While processing the applications for additional locations, a concern was raised that the operations by both M/s SITA and M/s BCS were not captive (internal use) in nature, and there could have a commercial angle in the operation that involved



Contd.... 2

a service rendered to airlines operators. A further concern was whether such services, being offered in a sensitive area as civil aviation, should be regulated under any “service license”. Accordingly, a letter was written to Directorate General of Civil Aviation (DGCA) on 05.05.2014 and 04.08.2014) (see Annexure 7 and 8) requesting them to inform DOT, mentioning the sensitive nature of the communications that may be involved in these data communications, whether DGCA had given any permission/ authorization to the two organizations to provide Data-based services to airlines at different airports. DGCA was also requested to clarify whether there were any regulatory framework under which such services were mandated to be provided by the two organisations to airlines. DGCA replied on 02.06.2016 (See Annexure 9) that they had not given any permission/authorization to provide data-link services to any organisation as there were no regulations for the same. However, they provided a copy of air safety circular (4 of 2014) dated 05.05.2014 issued by them, (see Annexure 10)) which requires airline operators to use all suitable means to track their aircraft on real-time basis.

3.1 The frequency assignments for the additional locations requested by M/s SITA and M/s BCS were not made by DOT then, however, the existing licenses were not cancelled and were renewed based on request of the applicants. SITA has renewed their licensed up to 2021. However, M/s BCS has not renewed their licenses after 2014.

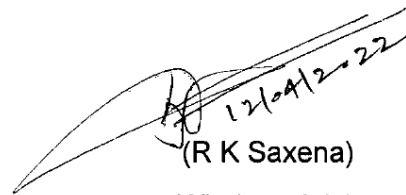
4. As per information made available to DOT by M/s BCS, both organisations use the assigned radio frequency to provide those services (data based services) to airlines operators which is not already provided by the Airport Authority of India (voice based communication mainly the Air traffic control service, i.e. ‘ATC’). Further, as per clarification provided by these organisations, the air-to-ground data link is used to obtain information from aircrafts such as passenger information, aircraft engine parameters, etc. through “Aircraft Communication Addressing and Reporting system (ACAR)”, operated under relevant International standards (ARINC etc.). Aeronautical Radio, Incorporated (ARINC), established in 1929, is a major provider of transport communications and systems engineering solutions for eight industries viz. aviation, airports, defense, healthcare, networks, security etc.

5. The VHF data link services consist of the data for the tracking the aircraft for safety of flights. The data includes the position reports, weather updates, engine health messages etc. Considering that VHF Data Link Services to provide ACAR service can be beneficial to track aircrafts on a real-time basis and help investigations/ search and



rescue operations in the unfortunate event of aviation disaster, TRAI is requested, under the terms of clause 11(1)(a) of TRAI Act, 1997 as amended by TRAI Amendment Act,2000 to provide recommendation on the following.

- i. An appropriate mechanism to regulate the services provided by these organizations ;
- ii. The manner in which the frequency assignment should be made to these organizations, in light of the supreme Court judgment made in the 2G case in 2012 - to assign radio frequencies only through auction.

  
(R K Saxena)

Wireless Advisor

Enclosure : Annexure 1 to 10

**Annexure - 1****Existing License/DL of M/s SITA and M/s Bird Consultancy Services**

S.No.	Company Name	License No./DL	Location	Frequency	Issued on
1.	Bird Consultancy Services	FP-254/1	CHENNAI	131.825MHz	April 2008
2.	Bird Consultancy Services	FP-255/1	MUMBAI	131.825MHz	April 2008
3.	Bird Consultancy Services	FP-256/1	NEW DELHI	131.825MHz	April 2008
4.	Bird Consultancy Services	FP-257/1	KOLKATA	131.825MHz	April 2008
5.	SITA	P-6115/1+1SBY	AHMEDABAD	131.725MHz	Nov. 2006
6.	SITA	P-6116/1	KHAJURAHO	131.725MHz	Nov 2006
7.	SITA	P-6117/1+1SBY	NAGPUR	131.725MHz	Nov 2006
8.	SITA	P-6118/1+1SBY	JAMMU	131.725MHz	Nov 2006
9.	SITA	P-5969/1	PORT BLAIR	131.725MHz	Nov 2006
10.	SITA	P-5970/1	TRIVENDRAM	131.725MHz	Nov 2006
11.	SITA	P-6130/1	GOA	131.725MHz	Dec 2006
12.	SITA	P-6131/1+1SBY	COCHIN	131.725MHz	Jan 2008
13.	SITA	P-6133/1	PUNE	131.725MHz	Dec 2006
14.	SITA	P-6135/1+1SBY	SRINAGAR	131.725MHz	Dec 2006
15.	SITA	P-6136/1+1SBY	DELHI-II	131.725MHz	Oct 2007
16.	SITA	P-6137/1+1SBY	MUMBAI-II	131.725MHz	Oct 2007
17.	SITA	P-6138/1+1SBY	LUCKNOW	131.725MHz	Oct 2007
18.	SITA	P-6139/1	JAIPUR	131.725MHz	Dec 2006
19.	SITA	P-6140/1+1SBY	COIMBATORE	131.725MHz	Dec 2006
20.	SITA	P-6141/1	PATNA	131.725MHz	Dec 2006
21.	SITA	P-6142/1	VISHAKAPATNAM	131.725MHz	Dec 2006
22.	SITA	FP-28/1	GUWAHATI	131.725MHz	Aug 2007
23.	SITA	FP-29/1	IMPHAL	131.725MHz	Aug 2007
24.	SITA	FP-292/1+1SBY	HYDERABAD	131.725MHz	May 2008
25.	SITA	FP-293/1-2+1SBY	BANGALORE	131.725MHz	May 2008
26.	SITA	P-4661/1	MUMBAI-1	131.725MHz	May 2010
27.	SITA	FP-818/1	KOLKATA	131.725MHz	May 2010
28.	SITA	FP-819/1	CHENNAI	131.725MHz	May 2010
29.	SITA	FP-820/1+1SBY	DELHI, IGI	131.725MHz	May 2010
30.	SITA	FP-405/1	MUMBAI	136.975MHz	Aug 2008
31.	SITA	FP-406/1	NEW DELHI	136.975MHz	Aug 2008
32.	SITA	FP-944/1	LEH	131.725MHz	Dec 2010

Government of India  
Ministry of Communications  
(W.P.C. Unit)

No.A-11014/4/87-WF

Sardar Patel Bhawan,  
Parliament Street,  
New Delhi – 110001.

9<sup>th</sup> December 1987

ORDER

**Subject: Royalty charges for the grant of licence to establish, maintain and work fixed/Land/Land Mobile Station under the provision of the Indian Telegraph Act, 1885.**

1. In pursuance of power conferred by section 4 of the Indian Telegraph Act, 1885 (13 of 1885), the Central Government hereby prescribes the following rates of royalty charges for the grant of licenses to establish, maintain and work Flex / land / Land Mobile wireless telegraph stations:-

2. The order shall come into force from 1<sup>st</sup> January, 1988.

3. The royalty shall be charged on the basis of maximum distance over which the network would operate and shall be categorised as below:-

Category	
Category I	Distance upto 5 kms.
Category II	Distance above 5 kms. but upto 60 kms. (VHF without repeater)
Category III	Distance above 60 kms. but upto 120 kms. (VHF with repeater)
Category IV	Distance above 120 kms. but upto 500 kms. (Generally HF links)
Category V	above 500 kms.

4. Circuits under category I, II, & III shall be charged on 24 hrs. basis. The circuits under IV & V may be charged on two time blocks i.e., 12 hours and 24 hours (day/night). The royalty for 12 hours block shall be 2/3 rate of 24 hours block.

5. Basic link in the circuit shall consist of 2 stations per frequency. Every additional station in the circuit over and above the basic two stations shall be charged royalty at the rate of 25% of the basic link royalty.

6. Royalty for the first year may be charged on quarterly basis as and where applicable, the quarter year being Jan-Mar, Apr-Jun, Jul-Sept and Oct-Dec. The charges for quarter year will be 1/4 of full year royalty.

7. Royalty charges for Duplex, semi-Duplex and multichannel circuits.

(i) Duplex & Semi-Duplex circuits:  
Twice the rate of single frequency (simplex) circuits.

(ii) Multichannel circuits:  
Charges on the basis of single frequency circuit multiplied by number of channels (capacity) of the licenced equipment.

(iii) Multi-frequency circuits:

For circuits employing more than one frequency in the network, even in simplex mode, basic royalty will be charged for each frequency separately.

8. Summary of Royalty Rates:

a)

Circuit Category	Annual Royalty Charges	
	24 hours	12 hours
I	Rs. 1200/-	-
II	Rs. 4800/-	-
III	Rs. 9000/-	-
IV	Rs. 15000/-	Rs. 10000/-
V	Rs. 20000/-	Rs. 13500/-

b) For every additional station in the circuit, over and above the basic 2 stations, per frequency:

Category	Annual royalty charges	
	24 hours	12 hours
I	Rs. 300/-	-
II	Rs. 1200/-	-
III	Rs. 2200/-	-
IV	Rs. 3700/-	Rs. 2300/-
V	Rs. 5000/-	Rs. 3300/-

NOTE: The licences may be issued/renewed for a period of 2 years at a time, if otherwise not required for shorter period.

9. This order supersedes the previous order on the subject which had been effective from 1<sup>st</sup> January 1968.
10. This issues with concurrence of the Ministry of Communications (Finance) vide their UO No. 1248/CF/87 dated 21 August 1987.
11. Please see separate order in respect of rates of licence fee towards the grant etc. of these licences.

Sd/-  
T.C. Gupta  
Assistant Wireless Adviser  
to the Government of India

Copy to

- All concerned
- Monitoring organization
- Engineer-in-Chief ...

560144/2022YO/o Sr.DWA (SACFA)

L-14027/101/2012-WF(E-File)



Government of India  
Ministry of Communications & IT  
Department of Telecommunications  
WPC-Wing

No: R-11014/26/2002-LR

Date: 06-05-2003

**CORRIGENDUM**

**Sub:** Royalty Charges for the grant of license to establish, maintain and work Fixed/Land/Land Mobile(wireless) station under The provisions of the Indian Telegraph Act, 1885

In pursuance of the powers conferred by section 4 of the Indian Telegraph Act, 1885 (13 of 1885) and in partial modification to this Ministry's Order No.R-11014/4/87-LR dated 9 December 1987, it has now been decided that para 3, para 4 and para 8 of the above said order be revised as follows:

- A. Para-3, The royalty shall be charged on the basis of maximum distance or the largest diameter of the area over which the network would operate and shall be categorized as below:-

Circuit Category	
Category- I	Distance up to 5Kms.
Category- II	Distance above 5Kms, but up to 25Kms.
Category- III	Distance above 25Kms, but up to 60Kms.
Category- IV	Distance above 60Kms, but up to 120Kms.
Category- V	Distance above 120Kms, but up to 500Kms.
Category- VI	Distance above 500Kms.

- B. Para-4, Circuits under category I, II, III & IV shall be charged on 24hrs basis. The circuits under Category V and VI may be charged on two-time blocks i.e. 12 hours and 24 hours (day/night). The royalty for 12 hours block shall be 2/3<sup>rd</sup> rate of 24 hours block.

- C. Para-8, Summary of Royalty Rates

Circuit Category	Annual Royalty Charges	
	24 Hours	12 Hours
Category- I	Rs. 1200/-	---
Category- II	Rs. 2400/-	---
Category- III	Rs. 4800/-	---
Category- IV	Rs. 9000/-	---
Category- V	Rs. 15000/-	Rs. 10000/-
Category- VI	Rs. 20000/-	Rs. 13500/-

Contd. 2/-

- 2 -

(b) For every additional station in the circuit, over and above the basic 2 stations, per frequency, the royalty charges would be as follows:

Circuit Category	Annual Royalty Charges	
	24 Hours	12 Hours
Category- I	Rs. 300/-	---
Category- II	Rs. 600/-	---
Category- III	Rs. 1200/-	---
Category- IV	Rs. 2200/-	---
Category- V	Rs. 3700/-	Rs. 2500/-
Category- VI	Rs. 5000/-	Rs. 3300/-

Note: The Licence may be issued/renewed for a period of 2 years at a time, if otherwise not required for shorter period.

- D. The above orders shall come into force from 01.4.2003.
- E. This issues with the concurrence of WFD vide their Dy. No. 400/03-WPF dated 2.5.2003
- F. All other conditions of the order No.R-11014/4/87-LR dated 9 December 1987 remain unchanged

(Ashok Kumar)

Joint Wireless Adviser to the Govt. of India

Copy to:

1. All Concerned
2. The Director, Wireless Monitoring Organization, New Delhi
3. The Director (Finance), Wireless Finance Division, DOT, WPC-Wing, Sanchar Bhavan, New Delhi

10/1/03 VMO ALB  
2/06/03  
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inben-repeater  
(2 freqs)  
Royalty  
Govt. II  
9000 + 2200 (93)

(5)

20

Government of India  
Ministry of Communications & IT  
Department of Telecommunications  
WPC Wing

Sanchar Bhavan,  
20 Ashoka Road,  
New Delhi - 110 001

No. R-11014/28/2004-LR

Dated the 23<sup>rd</sup> March 2005**ORDER**

Sub: Payment of Licence fee for the grant of Wireless Telegraph Station licence, fees for Surcharge for late renewal of licences etc.

In supersession of this Ministry's Order No. R-11014/4/87-LR dated 9<sup>th</sup> December 1987, and in pursuance of the Indian Telegraph Act, 1885 (13 of 1885), the Central Government hereby prescribes the following rates of (a) licence fees for the grant and renewal of various categories of licences and (b) surcharge for late renewal of licences:-

## I. Licence fee:

S.No.	Type of Licence	Revised fee Rupees per annum	Remarks
1.	Fixed / Land Station	500	Per station
2.	Land Mobile Station	250	Per Station
3.	Captive Paging (for Hub)	2000	(No royalty)
4.	Import Licence	500	per import licence
5.	Maritime Mobile Station (Fishing Trawlers)	500	per trawler
6.	Maritime Mobile Station (Ships)	5000	per ship
7.	Aeromobile Station Licence	5000	per aircraft
8.	USR (Short Range)	250	per station

Note: 1. The licence fee for 'Stand-by' set (s) shall also be charged at the above rates.

2. These licences shall be issued / renewed for a period of 2 years at a time, if otherwise not required for a shorter period.

Contd., 2/-

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- 2 -

ii. Duplicate copy of licence / Schedules / Renewal Certificates - Fee for issuance of

S.No.	Type of Licence	Revised fee Rupées per annum
1.	Duplicate copy of Licence and / or Licence Schedule	500
2.	Duplicate copy of renewal certificate	250

iii. Surcharge for late renewal of wireless telegraph station licences:

Surcharge / Late fee for delayed renewal of various licences @ 2% (of the total fee payable i.e. Licence fee plus Royalty charges) per month or part there of, subject to a minimum of Rs.250/- per licence. In case of delay of more than one year, the late fee would be compounded annually.

IV. These orders shall come into force from 1<sup>st</sup> April 2005. However, in cases where the licences had already been issued / renewed for a period falling beyond 31<sup>st</sup> March 2005, it shall be effective from the date of their next renewal.

V. The revised rates have been fixed with the concurrence of the Wireless Finance Division vide their U.O. No. 143 / D (F-WPF) 05 dated 23<sup>rd</sup> March 2005.

VI. There is no change in respect of rates of royalty spectrum charges for the grant of these licences, which would continue to be regulated as per Order No. R-11014/26/2002-LR dated 6.5.2003.

*J. K. Varada Krishna*  
29/3/05  
(T. K. Varada Krishna)  
Assistant Wireless Adviser  
to the Government of India

Copy to:

1. All Concerned.
2. Monitoring Organisation
3. Engineers-in-Charge (Regions)
4. All Monitoring Stations
5. Wireless Finance Division

(37)



Government of India  
Ministry of Communications & IT  
Department of Telecommunication  
Wireless Planning & Co-ordination (WPC) Wing

Sanchar Bhavan,  
20, Ashoka Road,  
New Delhi-110 001

No. P-11014/34/2009-PP (I)

Date: 22<sup>nd</sup> March, 2012

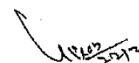
**ORDER**

Subject: Royalty charges for Assignments of Frequencies to 'Captive Users' (users being charged on formula basis) including all Government Users, involving **Single Channel** Operations for Fixed/ Land/ Land Mobile Stations/ terrestrial Broadcasting.

In pursuance of Power conferred by section 4 of the Indian Telegraph Act, 1885(13 of 1885) and in supersession of this Ministry's Orders No. R-11014/26/2002-LR dated 06.05.2003 and No. R-11014/4/87-LR dated 09.12.1987, the Central Government has decided the following Royalty charges for Assignments of Frequencies to 'Captive Users' (users being charged on formula basis) including all Government Users, involving **Single Channel** Operations for Fixed/ Land/ Land Mobile Stations/ Broadcasting:-

2. **Annual Royalty per Carrier (in Rs.) =  $M \times W$** ; and the following rules apply:

- i. The Basic Royalty (M) given below is for one carrier frequency in a Basic Link (simplex) of 2 Fixed/ Land/ Land Mobile stations (1 station for terrestrial Broadcasting).
- ii. The Minimum Channel bandwidth for charging purpose is 12.5 kHz.
- iii. Duplex circuits and Semi-duplex circuits shall be charged at twice the rate of simplex (single central frequency) circuits.
- iv. For multi-frequency circuits, even if operating in simplex mode, the Basic Royalty shall be charged for each frequency separately.
- v. For each additional station beyond the Basic Link (i.e. 2 stations), operating on the same carrier frequency, additional royalty will be charged @ 25% of that payable for the Basic Link of that frequency.
- vi. For the purpose of charging Royalty, the bandwidth factor W shall be computed in terms of a Unit Channel Width of 12.5 KHz (equivalent voice channel):  
**Actual Channel Bandwidth in kHz**  
$$W = \frac{\text{Actual Channel Bandwidth in kHz}}{12.5}, \text{ rounded to next higher integer.}$$
- vii. For all carrier frequencies, the chargeable bandwidth shall include the Guard Bands required to be provided as per ITU.
- viii. The following Table-A is applicable only for Single Channel Bandwidths up to 375 KHz, inclusive of guard-band.



Royalty Charges for Single channel

**Table A-for the 'M' Factor**

Distance Cat.	"Maximum Distance (KM) Over Which the F/L/LM Network would operate"	Royalty (in Rs.) for 24-hour operation of the Basic Link (M) per Carrier	Royalty (in Rs.) for 12-hour operation of the Basic Link, adjusted for inflation.	Per Carrier Royalty for each additional station beyond the Basic Pair (Rs.) working in the same frequency
		<i>M</i>	<i>m1</i>	<i>m2</i>
I	<= 2	1500	N/A	25%
II	<= 5	3000	N/A	25%
III	> 5 <= 25	6000	N/A	25%
IV	> 25 <= 60	12000	N/A	25%
V	> 60 <= 120	22500	N/A	25%
VI	> 120 <= 500	37500	25000	25%
VII	> 500	50000	33330	25%

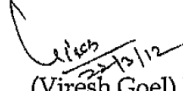
ix. In addition to above, the explanatory "Notes" on the applicability of royalty charges, are as following:

- A *simplex* operation is a method in which transmission is made possible alternately in each direction of a communication channel, e.g. by manual control.
- A *duplex* operation is a method in which transmission is possible simultaneously in both directions of a telecommunication channel.
- A *semi-duplex* operation is a method which is simplex operation at one end of the circuit and duplex operation at the other.
- To determine the "Maximum Distance" slab applicable to a case, the 'maximum power rating/ assigned' of the transmission equipment be considered, and expressly recorded in the assignment instrument Decision Letter, Agreement-in-Principle, or Wireless Operating License (DL/ AIP/ WOL).
- The *duration* of a radio frequency assignment will normally be one or two years. If an applicant desires, and frequencies are available, the duration of assignment may be fixed as three or four or five years.
- Before issuing any DL/ AIP/ WOL, full amounts of Royalty shall be submitted by the applicant in advance for the entire duration of the DL/ AIP/ WOL.
- For all assignments of frequencies, all applicants or users shall pay the applicable Royalty, License Fee, etc. **at the rates and terms in force from time to time, all previously paid amounts being adjusted on pro-rata basis.**
- Frequencies will normally be assigned, and hence charged, on 24-hour basis, unless indicated otherwise.

*11/06/2017*

Royalty Charges for Single channel

- x. The most highly demanded VHF/UHF bands of 146-174 MHz and 338-470 MHz the rates of Annual Royalty given above be increased by 15% and 10% *respectively* in the Municipal/ state areas of Mumbai, Delhi, Tamil Nadu, Karnataka and Andhra Pradesh. The enhanced charges shall become applicable to any wireless circuit whose even one station falls within these Service Areas.
3. For Charging of "Licence fee and other fees, Surcharge/ late fee and Charging Methodologies for Royalty / licence fees, Order No. No. P-11014/34/2009-PP (IV) dated 22<sup>nd</sup> March, 2012 shall be applicable
4. This issues with the concurrence of the Wireless Finance Division, vide this Dy. No.482/Sr.DDG(WPF), dated 19/3/12.
5. This Order shall come into force from 1st April 2012.

  
(Viresh Goel)  
Deputy Wireless Advisor  
to the Government of India

Copy to:

1. All concerned
2. Wireless Finance Division
3. Wireless Monitoring Organisation
4. Director, IT DoT for uploading on DoT website
5. DWA(ASMS) for uploading on WPC Wing website

Annexure-6New locations requested from M/s SITA

S. No.	Location	Geo-Coordinate	Frequency (MHz)	Emission	Power	Hours of Operation
1	Bhubaneswar	20N1516 / 085E4858	131.725	13K0A2D	20W	H24
2	Vadodara	22N1955 / 073E1300	131.725	13K0A2D	20W	H24
3	Mumbai	19N0531 / 072E5115	131.725	13K0A2D	20W	H24
4	Calicut	11N0823 / 075E5704	131.725	13K0A2D	20W	H24
5	Delhi	28N3324 / 077E0604	131.725	13K0A2D	20W	H24
6	Dibrugarh	27N2903 / 095E0122	131.725	13K0A2D	20W	H24
7	Indore	22N4340 / 075E4816	131.725	13K0A2D	20W	H24
8	Agartala	23N5334 / 091E1439	131.725	13K0A2D	20W	H24
9	Bagdogra	26N4106 / 088E1932	131.725	13K0A2D	20W	H24
10	Chandigarh	30N4008 / 076E4712	131.725	13K0A2D	20W	H24
11	Ranchi	23N1902 / 085E1931	131.725	13K0A2D	20W	H24
12	Raipur	21N1109 / 081E4426	131.725	13K0A2D	20W	H24
13	Varanasi	25N2655 / 082E5124	131.725	13K0A2D	20W	H24
14.	Kannur	11N5451 / 75E3253	131.725	13K0A2D	20W	H24
15.	Kannur	11N5451 / 75E3253	131.725	13K0A2D	20W	H24

**Annexure-6****New locations requested from M/s BCS**

S. No.	Location	Geo-Coordinate	Frequency (MHz)	Emission	Power	Hours of Operation
1	Patna	25N3531 / 086E0520	131.825	6K00F1B	25W	H24
2	Guwahati	26N0650 / 091E3507	131.825	6K00F1B	25W	H24
3	Goa	15N2246 / 073E4956	131.825	6K00F1B	25W	H24
4	Portblair	11N3834 / 092E4348	131.825	6K00F1B	25W	H24
5	Lucknow	26N4555 / 080E5317	131.825	6K00F1B	25W	H24
6	Pune	18N3444 / 073E5432	131.825	6K00F1B	25W	H24
7	Srinagar	33N5916 / 074E4620	131.825	6K00F1B	25W	H24
8	Jammu	32N4801 / 074E5311	131.825	6K00F1B	25W	H24
9	Ahmedabad	23N0359 / 072E5726	131.825	6K00F1B	25W	H24
10	Cochin	10N0936 / 076E2306	131.825	6K00F1B	25W	H24

L-14027/101/2012-WF(E-File)

O/o Sr.DWA (SACFA)



Government of India  
 Ministry of Communications & IT  
 Department of Telecommunications  
 6<sup>th</sup> floor, WPC Wing, 20, Ashoka Road  
 Sanchar Bhawan, New Delhi-110 001

No. L-14027/101/2012-WF/425

Dated: 05/05/2014

To  
 O/o Director General of Civil Aviation  
 Opp. Safdarjung Airport  
 New Delhi-110003

Subject: Grant of license for Fixed/Land/Mobile wireless station network.

Sir,

It has come to the notice of this Ministry that two agencies i.e. Bird Consultancy Services & M/s SITA are providing VHF data link services to various airlines companies, whereas, these agencies have been granted frequencies and license for their captive use only.

In a recent case, a clarification was requested from M/s Bird Consultancy Services (BCS) and further discussions have been held with them. It has been informed by M/s BCS representatives that while voice communication are still made through the AAI, the data-based services have been outsourced by the Ministry of Civil Aviation to private operators. Copies of this office letter to BCS along with their reply are enclosed.

Considering the sensitive nature of the communications that may be involved in these data communications, it is requested to kindly provide the details whether above referred entities have been given any permission/authorization by DGCA to provide data link services to airlines at different airports. Further, whether there are regulatory frameworks under which such services are mandated to be provided to airlines.

Encl: As above

Yours faithfully

(M.K. Pattanaik)

Assistant Wireless Adviser to the Govt. of India

M. K. PATTANAİK

Assistant Wireless Adviser

Department of Telecommunications

Sanchar Bhawan, New Delhi-110 001

Copy to:

1. Airport Authority of India Directorate of Communications, Rajiv Gandhi Bhawan, Safdarjung Airport New Delhi-110003. (Kind Att: Shri Rajith Ali Manager Communications)
2. ADG (CS-I), CS Cell, DOT, Sanchar Bhawan, New Delhi-110001
3. M/s Bird Consultancy Services, E-9, Connaught House, Connaught Place, New Delhi-110001, w.r.t their letter No. Nil dated 03.04.2014.
4. M/S SITA, 6, Factory Road, Near Safdarjung Hospital, Ring Road, New Delhi-110029



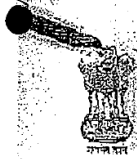
560144/2022/O/o Sr.DWA.(SACFA)

L-14027/101/2012-WF(E-File)

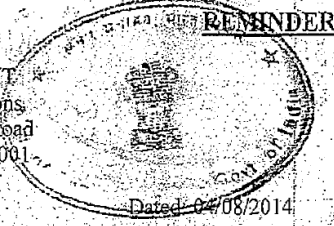
Annexure-8

Sam. 3.0/20

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Government of India  
Ministry of Communications & IT  
Department of Telecommunications  
6<sup>th</sup> floor, WPC Wing, 20, Ashoka Road  
Sanchar Bhawan, New Delhi-110 001



No. L-14027/101/2012-WF/1631

To  
O/o Director General of Civil Aviation  
Opp. Safdarjung Airport  
New Delhi-110003

Subject: Grant of license for Fixed/Land/Mobile wireless station network.

Sir,

I am directed to refer to this office letter of even no. dated 05/05/2014 (copy enclosed) and to request you to expedite reply whether M/s Bird Consultancy Services & M/s SITA have been given any permission/authorization by DGCA to provide data link services to airlines at different airports. Further, whether there are regulatory frameworks under which such services are mandated to be provided to airlines.

As the matter concerns the safety of the aircrafts an early reply is requested.

Encl: As above

Yours faithfully

*(Signature)*

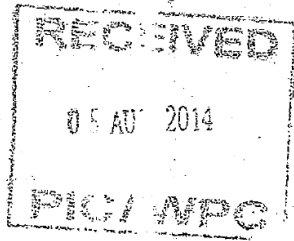
(M.K.Pattanaiik)

Assistant Wireless Adviser to the Govt. of India

Asstt. Wireless Adviser  
Sanchar Bhawan, Safdarjung  
Delhi-110003

Copy to:

1. Airport Authority of India Directorate of Communications, Rajy Gandhi Bhawan, Safdarjung Airport New Delhi-110003. (Kind Att: Shri Rajith Ali Manager Communications)
2. ADG (CS-I), CS Cell, DOT, Sanchar Bhawan, New Delhi-110001
3. M/s Bird Consultancy Services, E-9, Connaught House, Connaught Place, New Delhi-110001, w.r.t their letter No. Nil dated 03.04.2014.
4. M/S SITA, 6, Factory Road, Near Safdarjung Hospital, Ring Road, New Delhi-110029



Sr.DWA (SACFA)

L-14027/101/2012-WF(E-III)

31(R)



GOVERNMENT OF INDIA  
DIRECTORATE GENERAL OF CIVIL AVIATION  
Office of the Joint Director General (LG)  
Opposite Safdarjung Airport  
New Delhi-110003

No. AV-60011/61/2015-AS

Dated: 02.06.2016

To

The Assistant Wireless Advisor to Government of India  
Ministry of Communication & IT  
Department of Telecommunications  
6<sup>th</sup> Floor, WPC Wing, Ashoka Road  
Sanchar Bhawan, New Delhi-110001

Sub: Grant license for fixed/Land/Mobile wireless station network.

Sir,

Reference please be made to DOT letter No-L-14027/101/2012-WF/1634, dated 04.08.2014.

DGCA has not given any permission/authorization to provide data link services to any organization as there are no regulations for the same.

Further, Air Safety Circular 4 of 2014 dated 05.05.2014, requires airline operators to use all suitable means to track their aircraft on real-time basis. A copy of the circular is enclosed for information and necessary action.

Yours faithfully

  
(Lalit Gupta)

Joint Director General  
For Directorate General of Civil Aviation





GOVERNMENT OF INDIA  
OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION  
TECHNICAL CENTRE, OPP. SAFDARJUNG AIRPORT, NEW DELHI

**AIR SAFETY CIRCULAR 04 of 2014**

File No. AV15019/04/2014-AS

Dated: 5<sup>th</sup> May 2014

Subject: ACARS and its continuous operation during flight

**1. INTRODUCTION**

1.1 Aircraft Communications Addressing and Reporting System (ACARS) a digital datalink system, is increasingly being used for transmission of short messages between aircraft and ground stations via airband radio (HF and VHF) or satellite and also for flight tracking. Major functions of ACARS areas follows:

- a) It automatically detects and report changes to the flight phases (out of the gate, off the ground, on the ground and into the gate).
- b) Interfaces with Flight Management System (FMS) for communication of flight plans and weather information from the ground station, which enables the airlines to update the FMS during flight and allows the flight crew to examine new weather conditions or alternative flight plans.
- c) Transmits information from the aircraft to ground stations about the conditions of various aircraft systems and sensors on real-time basis including maintenance faults and abnormal events for health monitoring of equipment and better planning of repairs and maintenance related tasks.

1.2 Automated ping messages are used to test aircraft connection with the communication station. A ping response indicates healthy ACARS communication. In the event of aircraft ACARS unit being silent for a longer than a preset time interval, the ground station can ping the aircraft (directly or via satellite).

1.3 ACARS data is, therefore, of great significance in locating the last position of the aircraft and launch search and rescue after it has met with an accident. In a recent accident, which has drawn the attention of all concerned across the globe, the preliminary report has revealed that after ACARS stopped transmitting, the satellite

communication system automatically transmitted seven messages that confirmed that the system was still logged onto the network. With the primary radar data, analysis of satellite data and aircraft performance data, the investigators have been able to establish the probable search areas of ill-fated aircraft.

1.4 While IATA has created a Taskforce that will make recommendations by the end of year 2014 as to how commercial aircraft can be tracked continuously, we need to implement measures in the interim period with an objective of increasing the capability of all agencies involved with airline operations to effectively track their aircraft.

## **2. OBJECTIVE**

Objective of this Circular is to clearly state the policy and procedures of 'Flight Following' on real time basis by all Indian scheduled/non-scheduled operators with immediate effect.

## **3. INSTRUCTIONS FOR COMPLIANCE**

3.1 In view of difficulties faced in the search and rescue, after an aircraft goes missing or meets with an accident, all operators operating commercial flights are required to ensure the following:

- a) Operators should use all suitable means to track all its aircraft engaged in the carriage of passengers/cargo from departure (Chocks-off) to arrival (Chocks-on) so as to ensure real time tracking.
- b) Aircraft wherein the ACARS system is not available/disabled, operator must ensure real time flight tracking using Automatic Dependent Surveillance – Broadcast (ADS-B).
- c) Operators must ensure that ACARS/ADS-B are fully functional before every departure.
- d) Strict instructions should be given to the flight crew not to switch it off during the flight.
- e) Areas where there is no coverage of ACARS/ADS-B, operator should devise a procedure for effective tracking of the aircraft. While flying over such areas, the flight crew should report the aircraft coordinates, speed and altitude at an interval of not exceeding 15 minutes.

- f) Flight crew should immediately report to the ground station any intermittent behaviour/unserviceability of ACARS/ADS-B during flight either using data link or voice message.
- g) Operators should monitor both fault and warning messages of ACARS. They should opt for this facility from their service providers.

3.2 All operators are required to develop procedures for compliance of Para 3.1 of this Circular and submit in writing to DGCA.

3.2.1 The procedures must be specific and cover each aircraft on the AOP.

3.2.2 The procedures must be conducted under the supervision of a Post Holder who shall be accountable for proper implementation.

3.2.3 The procedures must contain specific instructions and actions in the event when an aircraft is declared 'overdue', 'missing' or 'unreported'.

3.3 DGCA will review the implementation of this circular in its surveillance inspections.

3.4 The above instructions are for strict compliance by all scheduled/non-scheduled operators.



(Dr. Prabhat Kumar)  
Director General of Civil Aviation

To

All Scheduled/Non-Scheduled Operators

**LIST OF ACRONYMS**

<b>S. No.</b>	<b>Acronym</b>	<b>Description</b>
1	AAI	Airports Authority of India
2	ACARS	Aircraft Communication Addressing and Reporting System
3	ACMA	Australian Communications and Media Authority
4	ADS-B	Automatic Dependent Surveillance – Broadcast
5	ADS-C	Automatic Dependent Surveillance-Contract
6	AGR	Adjusted Gross Revenue
7	AGS	Aeronautical Ground Station
8	AIP	Agreement-In-Principle
9	AITI	Authority for Info-communications Technology Industry
10	ANSP	Air Navigation Service Provider
11	AOC	Aeronautical Operational Control
12	ARINC	Aeronautical Radio, Incorporated
13	ATC	Air Traffic Control
14	ATMS	Air Traffic Management Services
15	BCS	Bird Consultancy Services
16	BIPT	Belgian Institute for Postal Services and Telecommunications

<b>S. No.</b>	<b>Acronym</b>	<b>Description</b>
17	CAA	Civil Aviation Authority
18	CAR	Civil Aviation Requirements
19	CASA	Civil Aviation Safety Authority
20	CLD	Departure Clearance Uplink
21	CNPN	Captive Non-Public network
22	CPDLC	Controller Pilot Data Link Communication
23	CSP	Communication Service Provider
24	D-ATIS	Datalink Automatic Terminal Information Services
25	DCL	Departure Clearance Downlink
26	DGCA	Directorate General of Civil Aviation
27	DL	Decision Letter
28	DME	Distance Measuring Equipment
29	DoT	Department of Telecommunications
30	DPL	Dealers Possession License
31	D-VOLMET	Datalink-meteorological information for aircraft in flight
32	EHF	Extremely High Frequency
33	FAA	Federal Aviation Administration
34	FANS	Future Air Navigation System
35	FCC	Federal Communications Commission

<b>S. No.</b>	<b>Acronym</b>	<b>Description</b>
36	FMS	Flight Management Systems
37	GCAA	General Civil Aviation Authority
38	GURL	General User Radio License
39	HF	High Frequency
40	IMO	International Maritime Organization
41	ITU	International Telecommunications Union
42	LF	Low Frequency
43	LoI	Letter-of-Intent
44	LTE	Long Term Evolution
45	MF	Medium Frequency
46	NFAP	National Frequency Allocation Plan
47	OFCOM	Office of Communications
48	OOOI	Out of the gate, Off the ground, On the ground, and Into the gate
49	PANS	Procedures for Air Navigation
50	QCAA	Qatar Civil Aviation Authority
51	RCD	Request for Departure Clearance Downlink
52	RF	Radio Frequency
53	RRF	Register of Radio Frequencies
54	SACFA	Standing Advisory Committee on Frequency Allocation

<b>S. No.</b>	<b>Acronym</b>	<b>Description</b>
55	SARP	Standards and Recommended Practices
56	SATCOM	Satellite Communications
57	SHF	Super High Frequency
58	SITA	Société Internationale de Télécommunications Aéronautique
59	TCAS	Traffic alert and Collision Avoidance System
60	TDRA	Telecommunications and Digital Government Regulatory Authority
61	TRAI	Telecom Regulatory Authority of India
62	UHF	Ultra High Frequency
63	UL	Unified License
64	VHF	Very High Frequency
65	VLF	Very Low Frequency
66	VSAT-CUG	Very Small Aperture Terminals - Closed User Group
67	WHO	World Health Organization
68	WMO	World Meteorological Organization
69	WOL	Wireless Operating License
70	WPC	Wireless Planning and Coordination