
**Authorisation under the Wireless
Telegraphy Act 2006 of Inmarsat Ventures
Limited's ground-based stations forming
part of its system for provision of mobile
satellite services for aeronautical use**

Non-confidential version – Redacted [X] for publication

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1. Introduction

- 1.1 This decision concerns use of frequency bands 1980 to 1995 MHz and 2170 to 2185 MHz (“the Frequency Bands”). Pursuant to EU law, those bands must be used for implementation of systems providing Mobile Satellite Services (“MSS”).
- 1.2 The applicant, Inmarsat Ventures Limited (“Inmarsat”) was one of two companies¹ selected by the European Commission in 2009 to provide MSS across the EU.²
- 1.3 Pursuant to Articles 7 and 8 of Decision 626/2008/EC of the European Parliament and of the Council on the selection and authorisation of systems providing mobile satellite services (MSS) (“the EU Decision”), Member States are required to ensure that their competent authorities authorise Inmarsat (as one of the two “selected applicants”) to use the Frequency Bands within their territories (1) for the provision of MSS; and (2) for the provision of “complementary ground components” (“CGC”) of systems providing MSS. The definitions of MSS and CGC within EU law are set out at paragraph 2.2 below.
- 1.4 Those requirements are implemented in UK law by means of The Authorisation of Frequency Use for the Provision of Mobile Satellites Services (European Union) Regulations 2010 (SI 2010/672), as amended³ (the “Regulations”).
- 1.5 Regulation 3(1) of the Regulations requires Ofcom (as competent authority in the UK) to authorise Inmarsat to use the Frequency Bands in the UK in accordance with the conditions specified in regulation 4(1), which include that they should be used for the provision of MSS. Ofcom duly authorised Inmarsat on 31 August 2010, authorisation reference 0828371/1 (“Inmarsat’s MSS Authorisation”). Inmarsat’s MSS Authorisation was granted for a period of 18 years with effect from 14 May 2009.
- 1.6 Regulation 13 of the Regulations requires Ofcom on request to authorise Inmarsat to use the Frequency Bands for CGCs of systems providing MSS, subject to the common conditions specified in Article 8(3) of the EU Decision.
- 1.7 Inmarsat has informed Ofcom that it intends to use the Frequency Bands to provide broadband services to passengers on aircraft flying over Europe. The service that Inmarsat proposes to provide is called the European Aviation Network (“EAN”), and will consist of a combination of satellite and ground-based communication links to the aircraft (the key components of the EAN are discussed in Section 3).
- 1.8 Inmarsat has requested Ofcom to authorise the use of the ground-based stations forming part of the EAN in accordance with regulation 13(2) of the Regulations. This decision concerns the grant to Inmarsat by Ofcom of a wireless telegraphy licence which authorises radio transmission use of the ground-based stations within the UK. The ground-based

¹ The other company is EchoStar Mobile Limited (formerly Solaris Mobile Limited).

² Inmarsat and EchoStar were selected in Decision 2009/449/EC.

³ The Regulations were amended by Authorisation of Frequency Use for the Provision of Mobile Satellite Services (European Union) (Amendment) Regulations 2013 (SI 2013/174).

stations will transmit radio signals to, and receive them from, aircraft which utilise Inmarsat's EAN service.

1.9 Based on the information provided by Inmarsat (as set out in Section 3 below), Ofcom is satisfied that (if the EAN is implemented in the way described by Inmarsat) the ground-based stations will constitute CGCs as defined in the EU Decision and the Regulations; and will comply with the applicable common conditions. Ofcom has therefore decided to grant Inmarsat an authorisation to transmit on the Frequency Bands using the ground-based stations, pursuant to section 8 of the Wireless Telegraphy Act 2006 ("WTA"). This authorisation will be issued shortly.

1.10 The remainder of this decision is structured as follows:

- a) Section 2 sets out the applicable legal framework;
- b) Section 3 describes Inmarsat's EAN system, based on the information which has been provided to Ofcom;
- c) Section 4 explains the conditions of the authorisation, and identifies next steps in relation to monitoring Inmarsat's compliance with those conditions.

2. Legal framework

EU Decision

2.1 The European Commission harmonised the conditions for the availability and efficient use of the frequency bands 1980 to 2010 MHz (earth-to-space) and 2170 to 2200 MHz (space-to-earth) for systems providing MSS. The harmonised approach is contained a number of Decisions addressed to Member States. The Decisions are:

- a) Commission Decision of 14 February 2007 on the harmonised use of radio spectrum in the 2 GHz frequency bands for the implementation of systems providing mobile satellite services (“Decision 2007/98/EC”). This decision required Member States to designate and make available, by 1 July 2007, the frequency bands 1980 to 2010 MHz and 2170 to 2200 MHz for systems providing MSS.
- b) Decision No. 626/2008/EC of the European Parliament and of the Council of 30 June 2008 on the selection and authorisation of systems providing mobile satellite services (MSS) (“the EU Decision”). This decision set out the specific framework for the coordinated selection and authorisation process at EU level to be applied to the 2GHz bands.
- c) Commission Decision of 13 May 2009 on the selection of operators of pan-European systems providing mobile satellite services (MSS) (“Decision 2009/449/EC”). This decision selected Inmarsat and Solaris Mobile Limited⁴ (“the Operators”) as the operators of pan-European systems providing mobile satellite services and set out the frequencies which each selected applicant shall be authorised to use in each Member State.
- d) Commission Decision of 10 October 2011 on modalities for coordinated application of the rules on enforcement with regard to mobile satellite services (MSS) pursuant to Article 9(3) of Decision No 626/2008/EC of the European Parliament and of the Council (“Decision 2011/667/EU”). This decision supplements the enforcement provisions contained in the EU Decision.

2.2 The EU Decision provided for two different authorisations; an MSS authorisation and CGC authorisation. Article 2(2) of the EU Decision defines MSS and CGC as follows:

“mobile satellite systems’ shall mean electronic communications networks and associated facilities capable of providing radio-communications services between a mobile earth station and one or more space stations, or between mobile earth stations by means of one or more space stations, or between a mobile earth station and one or more complementary ground components used at fixed locations. Such a system shall include at least one space station”.

⁴ Now Echostar Mobile Limited.

“complementary ground components’ of mobile satellite systems shall mean ground-based stations used at fixed locations, in order to improve the availability of MSS in geographical areas within the footprint of the system’s satellite(s), where communications with one or more space stations cannot be ensured with the required quality”.

2.3 With regards to the MSS authorisation, Article 7 of the EU Decision provides that Member States should ensure that the selected applicants have the right to use the relevant frequency bands, subject to certain common conditions specified in Article 7(2).

2.4 Article 8 of the EU Decision concerns the authorisation of CGCs. It provides in relevant part as follows:

“1. Member States shall, in accordance with national and Community law, ensure that their competent authorities grant to the applicants selected in accordance with Title II and authorised to use the spectrum pursuant to Article 7 the authorisations necessary for the provision of complementary ground components of mobile satellite systems on their territories.

2. ...

3. Any national authorisations issued for the operation of complementary ground components of mobile satellite systems in the 2 GHz frequency band shall be subject to the following common conditions:

(a) operators shall use the assigned radio spectrum for the provision of complementary ground components of mobile satellite systems;

(b) complementary ground components shall constitute an integral part of a mobile satellite system and shall be controlled by the satellite resource and network management mechanism; they shall use the same direction of transmission and the same portions of frequency bands as the associated satellite components and shall not increase the spectrum requirement of the associated mobile satellite system;

(c) independent operation of complementary ground components in case of failure of the satellite component of the associated mobile satellite system shall not exceed 18 months;

(d) rights of use and authorisations shall be granted for a period of time ending no later than the expiry of the authorisation of the associated mobile satellite system.”

The Regulations

2.5 The UK implemented the EU Decisions into national law by means of the Regulations, as amended.

2.6 The Regulations define “mobile satellite services” as follows:

““mobile satellite services” means radio communication services provided by an electronic communications network and associated facilities capable of providing

*radio communication services between a mobile earth station in the United Kingdom and one or more space stations, or between mobile earth stations in the United Kingdom by means of one or more space stations”.*⁵

2.7 The Regulations define CGC as follows:

*“ground-based stations used at fixed locations in order to improve the availability of mobile satellite services in geographical area covered by those services.”*⁶

2.8 Regulation 3 requires Ofcom to authorise the Operators for the provision of MSS within the UK, subject to the common conditions set out in Regulation 4.⁷

2.9 Regulation 13 requires Ofcom also to authorise the Operators to provide CGCs within the UK if such authorisation is requested, subject to the common conditions set out in Article 8(3) of the EU Decision:

“(1) OFCOM shall carry out their functions under the Wireless Telegraphy Act 2006 so as to give effect to the obligations of the United Kingdom under the EU Decision and the Commission Decision in so far as those obligations have not been given effect by these Regulations.

(2) OFCOM shall in particular pursuant to their powers under that Act grant a selected applicant, if requested, the authorisation necessary for the provision of complementary ground components of systems providing mobile satellite services subject to the common conditions specified in Article 8(3) of the EU Decision.”

Licensing powers under the WTA

2.10 Section 8(1) of the WTA confers on Ofcom a power to grant a wireless telegraphy licence in respect of a “wireless telegraphy station” or “wireless telegraphy apparatus”.⁸ Any CGC authorisation granted by Ofcom under regulation 13 of the Regulations would be a wireless telegraphy licence issued under this section.

Ofcom’s duties

2.11 As mentioned above, Ofcom has an obligation under the Regulations to grant an authorisation under the WTA in respect of CGCs. In addition, Ofcom has had regard to its general duties under the Communications Act 2003 and the WTA. In summary, these duties include in particular:

⁵ Regulation 1.

⁶ Regulation 13(3)

⁷ As noted above, Ofcom duly authorised Inmarsat in respect of the United Kingdom on 31 August 2010. Inmarsat’s MSS Authorisation allows Inmarsat to transmit and receive within the frequency bands 1980 to 1995MHz for earth to space communications and 2170 to 2185 MHz for space to earth communications. Inmarsat’s MSS Authorisation was granted for a period of eighteen years with effect from 14 May 2009.

⁸ These terms are defined in section 117 of the Wireless Telegraphy Act 2006.

- a) Under the Communications Act 2003 Ofcom's principal duty is to (a) further the interests of citizens in relation to communications matters and (b) further the interests of consumers in relevant markets, where appropriate by promoting competition.⁹ Further, Ofcom is required to secure, in the carrying out of its functions, the optimal use for wireless telegraphy of the electro-magnetic spectrum.¹⁰
- b) Under the WTA Ofcom must, in the carrying out of its radio spectrum functions, have regard in particular to (a) the extent to which the electromagnetic spectrum is available for use, or further use, for wireless telegraphy; (b) the demand for use of the spectrum for wireless telegraphy; and (c) the demand that is likely to arise in future for the use of the spectrum for wireless telegraphy.¹¹ Further, in the carrying out of these functions, Ofcom must also have regard, in particular, to the desirability of promoting (a) the efficient management and use of the part of the electromagnetic spectrum available for wireless telegraphy; (b) the economic and other benefits that may arise from the use of wireless telegraphy; (c) the development of innovative services; and (d) competition in the provision of electronic communications services.¹²

⁹ Communications Act 2003, s 3(1).

¹⁰ Communications Act 2003, s 3(2).

¹¹ Wireless Telegraphy Act 2006, s 3(1).

¹² Wireless Telegraphy Act 2006, s 3(2).

3. Inmarsat's EAN

Ofcom's 2016 consultation

- 3.1 In 2009, following consultation, Ofcom issued a statement¹³ on the terms of a wireless telegraphy licence which would permit the use of the relevant frequency band by a CGC network (the "Spectrum Access 2 GHz Licence"). However, in 2009, there were no concrete plans for the type of service that CGCs might support.
- 3.2 Accordingly, the Spectrum Access 2 GHz Licence conditions were designed for a service provided to terrestrial users. Inmarsat is now proposing to develop and roll out ground-based stations to support a mobile broadband service to aircraft as part of a combined satellite and terrestrial system. Inmarsat has, therefore, requested that Ofcom review the authorisation regime for CGCs in light of these plans.
- 3.3 On 22 February 2016 Ofcom issued a consultation on the authorisation of terrestrial mobile networks complementary to 2 GHz MSS for aeronautical use.¹⁴ The purpose of this document was to consult on a new and additional CGC licence in order to authorise the ground-based stations forming part of its EAN. It also, among other things, considered the consistency of Inmarsat's planned use of the spectrum with the EU legal framework.¹⁵
- 3.4 We received representations which argued that Inmarsat's EAN was not consistent with the EU legal framework on the basis that its ground-based stations did not fall within the definition of CGCs. We considered these representations and requested further information from Inmarsat about its EAN service, which was evolving.¹⁶ Accordingly, over time, Ofcom has developed a better understanding of how the EAN will operate and how it will be marketed.
- 3.5 The rest of this section sets out Ofcom's understanding of how the EAN works, based on information provided in response to our information requests.

How does the EAN work?

- 3.6 Inmarsat has told Ofcom that it wishes to provide a mobile broadband service to aircraft flying over Europe. It wishes to use a combination of satellite and ground-based

¹³ Ofcom, Statement on the authorisation of terrestrial mobile networks of complementary to 2 GHz mobile satellite systems (MSS), 17 July 2009, <https://www.ofcom.org.uk/__data/assets/pdf_file/0023/41792/2ghzstatement.pdf>.

¹⁴ Ofcom, Consultation on the authorisation of terrestrial mobile networks complementary to 2 GHz Mobile Satellite Service (MSS), 22 February 2016, <https://www.ofcom.org.uk/__data/assets/pdf_file/0021/77115/2ghz_consultation.pdf>.

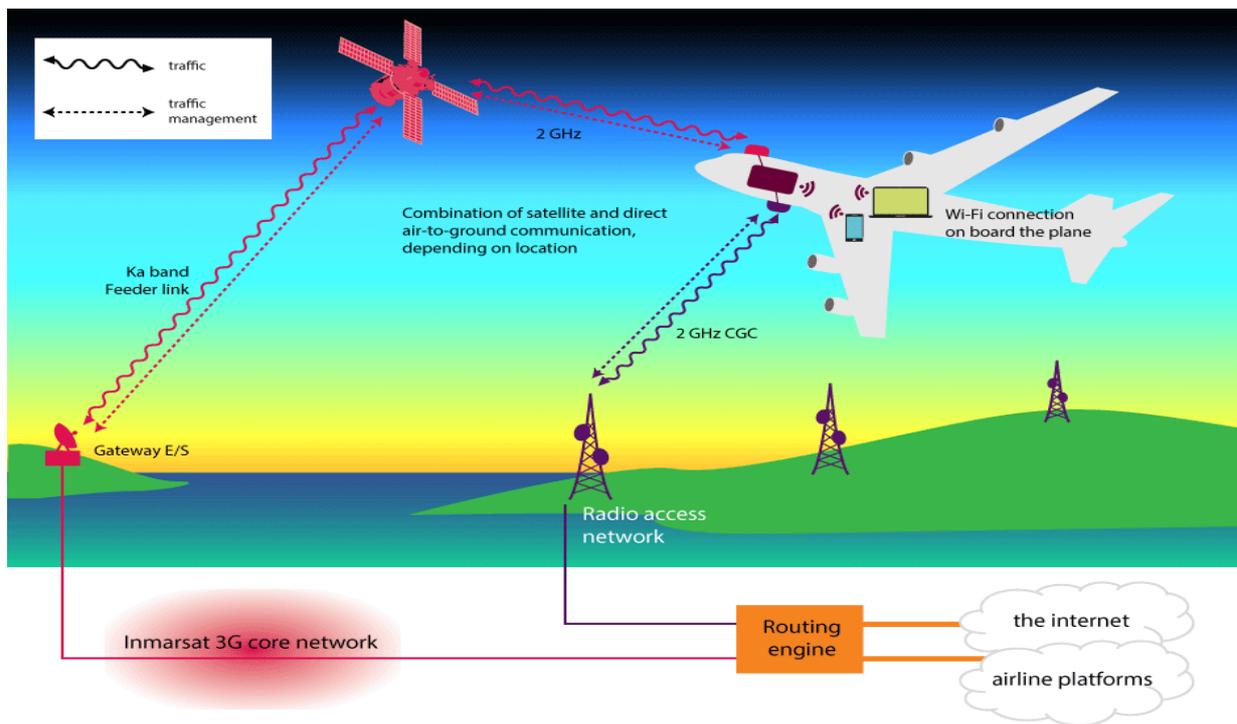
¹⁵ See paragraph 1.5 of the 2016 consultation.

¹⁶ Ofcom has formal powers to request information under section 32A of the WTA and regulation 5(3) of the Regulations. Ofcom used these powers to request information from Inmarsat. Under the WTA it is an offence to fail to provide the requested information, or to provide false information. Ofcom can also impose monetary penalties for failure to comply with information requests under both the Regulations and the WTA.

components as part of an integrated system. It plans to provide broadband connectivity to aircraft passengers, and also to serve some operational requirements of the aircraft.

- 3.7 Figure 1, below, is a simplified illustration of the system diagram that Inmarsat has provided to us. It illustrates the different elements of Inmarsat’s planned service. Note that both the traffic and traffic management links are bi-directional.

Figure 1: Simplified system diagram of Inmarsat’s European Aviation Network (EAN)



- 3.8 There are various communication links which make up the proposed EAN system.
- Passengers on the plane connect their devices via a standard Wi-Fi connection to a **Communications Manager** on the aircraft.
 - The Communications Manager connects with terminals fixed to the top and bottom of the plane’s fuselage.
 - The terminal on the top of the plane (the **Satellite Terminal**) connects with Inmarsat’s satellite, which in turn connects to a satellite gateway located in Greece. Collectively, the Satellite Terminal, the satellite and the satellite gateway will be referred to as the **Satellite Segment**.
 - The terminal on the bottom of the plane (the **Ground-facing terminal**) connects to a ground-based LTE antennas located throughout Europe (**Ground-based Stations**). Collectively, the Ground-facing Terminal and the Ground-based Stations will be referred to as the **Terrestrial Segment**.
 - Both the satellite gateway and the Ground-based Stations connect to a **Routing Engine** (also referred to as the Integrated Transport Management Centre) which receives internet services from internet services providers. The Routing Engine determines

whether the Communications Manager on the plane should use the Satellite Terminal or the Ground-facing Terminal according to prevailing congestion, traffic load and link quality to make optimum use of the available radio resources.

Terrestrial Segment

- 3.9 When completed, the Terrestrial Segment of Inmarsat's EAN will comprise around 300 Ground-based Stations across Europe.¹⁷ Each of the Ground-based Stations has a range of 80-150km.¹⁸ As at June 2017, 41 sites had been completed.¹⁹ At that point in time, Inmarsat estimated that the majority of the Ground-based Stations [~~Confidential information redacted~~] would be completed by 30 September 2017; and that all Ground-based Stations would be in place by [].²⁰
- 3.10 Inmarsat plans to use the 1980 to 1995 MHz frequency band (the MSS uplink band) for Satellite Terminal-to-satellite and for Ground-facing Terminal to Ground-based Station transmission. It plans to use the 2170 to 2185 MHz frequency band (the MSS downlink band) for satellite-to-Satellite Terminal and for Ground-based Station to Ground-facing Terminal transmission. The Terrestrial Segment is planned, therefore, to use the same direction of transmission as the Satellite Segment (consistent with the requirements of the common conditions specified in Article 8(3) of the EU Decision).

Satellite Segment

- 3.11 On 6 February 2017, Inmarsat announced that its satellite gateway in Greece was complete and ready to support the operation of the EAN.²¹ On 28 June 2017, Inmarsat launched the satellite it intends to use within the EAN system;²² and on 1 September 2017, Inmarsat informed Ofcom that the satellite was "fully deployed, tested and brought into its operation phase at its final geostationary orbital location".²³
- 3.12 In relation to the Satellite Terminal which will be installed on aircraft, Inmarsat explained to Ofcom that it is developing two different Satellite Terminals, and has executed various contracts in this regard.

¹⁷ Inmarsat, 2GHz MSS Annual Report 2017 to COCOM MSS Working Group, 5 June 2017, p 11.

¹⁸ Inmarsat, 2GHz MSS Annual Report 2017 to COCOM MSS Working Group, 5 June 2017, p 11.

¹⁹ Inmarsat, Update on 2GHz MSS to COCOM MSS Working Group, 16 June 2017, slide 10.

²⁰ []

²¹ Inmarsat, Press release: Inmarsat completes testing of key satellite infrastructure for European Aviation Network, 6 February 2017 <<https://www.inmarsat.com/press-release/inmarsat-completes-testing-key-satellite-infrastructure-european-aviation-network/>>; see also Inmarsat, 2GHz MSS Annual Report 2017 to COCOM MSS Working Group, 5 June 2017, p 7.

²² Inmarsat, Press release: Inmarsat confirms successful launch of S-band satellite for the European Aviation Network, 29 June 2017 <<https://www.inmarsat.com/press-release/inmarsat-confirms-successful-launch-s-band-satellite-european-aviation-network/>>.

²³ Inmarsat, letter to Ofcom, 1 September 2017.

Cobham Satellite Terminal

- 3.13 On 30 September 2015, Inmarsat Global Limited (a subsidiary of Inmarsat) executed a contract with Thrane & Thrane A/S (trading as Cobham SATCOM) for S-Band Satellite Ground Network Infrastructure Development and Aviation Satellite Terminal Development for the procurement and delivery of a satellite terminal²⁴ (the “Cobham Satellite Terminal”). This terminal will be suitable for use on large aircraft.
- 3.14 On 12 May 2017, Inmarsat informed Ofcom that [X] the Cobham Satellite Terminal [X] would be available “prior to March 2018”.²⁵
- 3.15 On 14 July 2017, Inmarsat informed Ofcom [X²⁶] the Cobham Satellite Terminal is “expected to complete its aviation safety certification by March 2018”.

CSM Satellite Terminal

- 3.16 In parallel to the development of the Cobham Satellite Terminal, Inmarsat is developing a smaller Satellite Terminal referred to as the Compact S-Band Mobile Satellite Service (the “CSM Satellite Terminal”). This terminal will be an alternative to the Cobham Satellite Terminal on larger aircraft, but will also be suitable on smaller aircraft which would be unable to accommodate the Cobham Satellite Terminal.²⁷ [X²⁸]. The CSM Satellite Terminal will be commercially available by the end of December 2017²⁹ (i.e. sooner than the Cobham Satellite Terminal).
- 3.17 [X^{30,31}].
- 3.18 [X^{32,33,34}].

The EAN can technically be provided without the Satellite Terminal

- 3.19 Inmarsat confirmed to Ofcom that the EAN network functionality “can technically be provided without the satellite facing EAN MSS terminal installed on the aircraft”.³⁵ [X³⁶].
- 3.20 Inmarsat also informed Ofcom that the Terrestrial Segment “can intrinsically carry more traffic through the same amount of spectrum” than the Satellite Segment.³⁷ While the Satellite Segment can provide “full coverage”, it “has a significant lower performance, in

²⁴ Provided by Inmarsat on 29 September 2015 in accordance with Step 6 of Ofcom’s Compliance Notice of 11 March 2015.

²⁵ Inmarsat, letter responding to Ofcom’s information request of 11 April 2017, 12 May 2017, Annex 1, p 7.

²⁶ [X]

²⁷ Inmarsat, letter responding to Ofcom’s information request of 11 April 2017, 12 May 2017, Annex 1, p 6-7.

²⁸ [X]

²⁹ Inmarsat, letter responding to Ofcom’s information request of 11 April 2017, 12 May 2017, Annex 1, p 6-7. [X].

³⁰ [X]

³¹ [X]

³² [X]

³³ [X]

³⁴ [X]

³⁵ Inmarsat, email clarifying Inmarsat’s response to Ofcom’s information request of 2 December 2016, 19 January 2017.

³⁶ [X]

³⁷ Jones Day, Inmarsat’s response to Viasat’s challenge to EAN, 20 October 2016, p 13-14.

particular in very dense areas, as compared to CGC”.³⁸ As a result, Inmarsat said, they were “pushing for acceptance among airlines of both MSS and CGC terminals, so as to benefit from the optimum connectivity coverage that combination will provide”.³⁹ Inmarsat further stated that:

“The EAN system permits Inmarsat to configure and dynamically reconfigure the operational policy for both MSS and CGC transport paths for any IP service across the EAN fleet or for individual aircraft. Considerations for such decisions include Quality of Service, type of traffic, prevailing link quality, geographical boundary, time of day, location, aircraft height, among others. The chosen configuration will therefore strive to optimise coverage, grade of service and user experience.”⁴⁰

3.21 As set out in Section 4, the extent to which airlines install the Satellite Terminal is a critical consideration in determining whether the EAN is compliant with the legislative framework set out in the Regulations and the EU Decisions. The facts that the EAN can operate without the Satellite Terminal, and that airlines may have incentives not to install the Satellite Terminal, give rise to questions about the likely extent of installation of the Satellite Terminal. Naturally, at this point in time there is no data indicating the actual extent of installation of the Satellite Terminals. However, Ofcom has asked Inmarsat about the extent to which the EAN is offered and marketed as a hybrid system incorporating both the Satellite Terminal and the Ground-facing Terminal. Inmarsat’s responses on this topic are set out in detail below (see paragraphs 3.23-3.28).

Installation time of the Satellite Terminal

3.22 Ofcom understands that, where the Satellite Terminal (either the Cobham or CSM Satellite Terminal) is installed, it is likely to be installed after the Ground-facing Terminal.⁴¹ This is because Satellite Terminal and the Ground-facing Terminal require different times for installation. The Ground-facing Terminal can be installed during an overnight stopover which can be planned “almost anytime throughout the year”.⁴² On the other hand the Satellite Terminal requires a longer stopover, which “usually happens once a year during the low season”.⁴³

³⁸ Inmarsat, letter responding to Ofcom’s information request of 2 December 2016, response to question 4; see also Inmarsat, replacement annex to Inmarsat’s letter to Ofcom of 18 December 2016, sent by email on 13 December 2017, p 14-15.

³⁹ Inmarsat, letter responding to Ofcom’s information request of 11 April 2017, 12 May 2017, Annex 1, p 2.

⁴⁰ Inmarsat, letter responding to Ofcom’s information request of 2 December 2016, response to question 1(f).

⁴¹ Inmarsat, letter responding to Ofcom’s information request of 11 April 2017, 12 May 2017, Annex 1, pp 4, 6.

⁴² Inmarsat, letter responding to Ofcom’s information request of 2 December 2016, 18 December 2016, answer to question 5.

⁴³ Inmarsat, letter responding to Ofcom’s information request of 2 December 2016, 18 December 2016, answer to question 5; see also Inmarsat, letter responding to Ofcom’s information request of 11 April 2017, 12 May 2017, Annex 1, p 6-7.

Is the EAN offered and marketed as a hybrid system?

- 3.23 Inmarsat has informed Ofcom that the EAN has been designed as a hybrid network that utilises both the MSS and Terrestrial Segments.
- 3.24 Inmarsat has also confirmed to Ofcom that it is marketing the EAN as an integrated (satellite/terrestrial) system. In response to formal information requests, Inmarsat has stated that: [REDACTED^{44, 45, 46, 47, 48}].
- 3.25 Ofcom has also reviewed Inmarsat’s marketing material relating to the EAN. Inmarsat provided Ofcom with a commercial proposal to a “large European carrier” which was under negotiation in [REDACTED^{49, 50, 51}]. The marketing material available on Inmarsat’s website⁵², and the EAN website⁵³, describes the EAN as consisting of both the Ground-facing and Satellite Terminals.
- 3.26 When asked whether customers would be contractually obliged to install the Satellite Terminal, Inmarsat said that [REDACTED⁵⁴]. However, Inmarsat informed Ofcom that “customers will be obliged to install the Integrated Aircraft Communications Manager”.⁵⁵
- 3.27 In mid-March 2017 Inmarsat entered into a contract with International Airlines Group (“IAG”) “for the provision of connectivity services relying on EAN”.⁵⁶ Pursuant to this arrangement, British Airways would be the “launch customer” for the EAN.⁵⁷ [REDACTED⁵⁸]. In Ofcom’s view this demonstrates Inmarsat’s commitment to ensuring that IAG installs the Satellite Terminal on its fleet.
- 3.28 In addition, Ofcom was able to view evidence dating from May 2014 that Inmarsat was considering offering an integrated satellite/terrestrial service. Ofcom was shown a discussion document presented to Inmarsat’s board which [REDACTED⁵⁹].

44 [REDACTED]

45 [REDACTED]

46 [REDACTED]

47 [REDACTED]

48 [REDACTED]

49 [REDACTED]

50 [REDACTED]

51 [REDACTED]

52 <<http://www.inmarsat.com/aviation/aviation-connectivity-services/european-aviation-network/>>.

53 <<http://europeanaviationnetwork.com/how-it-works#elements-of-ean>>.

54 [REDACTED]

55 Inmarsat, letter responding to Ofcom’s information request of 11 April 2017, 12 May 2017, Annex 1, p 4.

56 Inmarsat, letter responding to Ofcom’s information request of 11 April 2017, 12 May 2017, Annex 1, p 2.

57 Inmarsat, 2GHz MSS Annual Report 2017 to COCOM MSS Working Group, 5 June 2017, p 14.

58 [REDACTED]

59 [REDACTED]

4. Conclusion: Ofcom's decision and next steps

- 4.1 As explained above, Inmarsat is authorised to provide MSS in the UK using the Frequency Bands on which it was selected to operate by the European Commission. Under the Regulations which implement the EU Decision in the UK, Ofcom is obliged upon request to authorise Inmarsat to provide CGCs of a system providing MSS in the UK subject to the common conditions laid down in Article 8(3) of the EU Decision.
- 4.2 Ofcom is therefore obliged to authorise Inmarsat to use the Ground-based Stations as part of the EAN provided that they fall within the definition of CGCs laid down in the EU Decision and the Regulations and will conform with the common conditions.
- 4.3 The relevant provisions of the legislation are set out in section 2 above. The applicable definitions in the Regulations are as follows:

*“mobile satellite services” means radio communication services provided by an electronic communications network and associated facilities capable of providing radio communication services between a mobile earth station in the United Kingdom and one or more space stations, or between mobile earth stations in the United Kingdom by means of one or more space stations”;*⁶⁰ and

*“complementary ground components” means ground-based stations used at fixed locations in order to improve the availability of mobile satellite services in geographical area covered by those services.”*⁶¹

- 4.4 On the basis of the information provided by Inmarsat, Ofcom is satisfied that the Ground-based Stations will constitute CGCs.
- a) The Ground-based Stations will be used at fixed locations.
 - b) Inmarsat has confirmed to Ofcom that its EAN system will make use both of the Satellite Segment and the Terrestrial Segment to provide service to aircraft. The Ground-based Stations comprising the Terrestrial Segment will therefore be used as complements to the MSS Segment.
 - c) The Ground-based Stations will improve the availability of MSS because the Satellite Segment alone would have a lower performance, particularly in very dense areas, than an integrated service (see para 3.20). Inmarsat’s intention is therefore that the Terrestrial Segment will be used as complements to the MSS, improving the availability of the MSS within the EU.

⁶⁰ Regulation 1.

⁶¹ Regulation 13(3)

4.5 Ofcom also considers, based on the information provided by Inmarsat, that the Ground-based Stations will comply with the common conditions set out in Article 8(3). Those conditions are as follows:

“(a) operators shall use the assigned radio spectrum for the provision of complementary ground components of mobile satellite systems;

(b) complementary ground components shall constitute an integral part of a mobile satellite system and shall be controlled by the satellite resource and network management mechanism; they shall use the same direction of transmission and the same portions of frequency bands as the associated satellite components and shall not increase the spectrum requirement of the associated mobile satellite system;

(c) independent operation of complementary ground components in case of failure of the satellite component of the associated mobile satellite system shall not exceed 18 months;

(d) rights of use and authorisations shall be granted for a period of time ending no later than the expiry of the authorisation of the associated mobile satellite system.”

4.6 Considering the common conditions in turn:

- a) Both the CGCs and the MSS Segment will make use of the Frequency Bands (see para 3.10);
- b) The CGCs are an integral part of Inmarsat’s EAN system; will be controlled by the satellite resource and network management mechanism (see para 3.8); and will use the same direction of transmission and the same portions of frequency bands as the MSS Segment of the EAN system (see para 3.10);
- c) Inmarsat’s satellite has been launched as is currently operational, and there is currently no reason to suppose that the satellite component of the EAN system will be unavailable for any period;
- d) Ofcom’s authorisation of Inmarsat to use the CGCs will be for the same period of time as its MSS Authorisation.

4.7 Accordingly, Ofcom has decided to authorise Inmarsat to use its Ground-based Stations to transmit in the Frequency Bands pursuant to section 8 of the Wireless Telegraphy Act 2006, subject to the common conditions set out in Article 8(3) of the EU Decision. This authorisation will be issued shortly.

4.8 Insofar as they are applicable, Ofcom is satisfied that its decision to authorise Inmarsat’s use of the Ground-based Stations is in accordance with its general duties under the Communications Act and the WTA. The authorisation will enable Inmarsat to use the Frequency Bands (which are currently lying fallow) to provide an innovative service to consumers in the UK and the EU. The system developed by Inmarsat incorporates the Ground-based Stations as an integral part. They are needed as part of the system in order to improve its availability and to ensure the required quality of aeronautical broadband services which the system will provide.

- 4.9 Ofcom notes that Inmarsat's EAN service can technically be provided without the Satellite Terminal being installed; and that there may be incentives for airlines not to install the Satellite Terminal, despite having purchased an integrated system from Inmarsat (these matters are set out in Section 3).
- 4.10 Ofcom therefore intends to monitor carefully the deployment of the EAN in order to ensure that the Ground-based Stations are indeed being used as complementary components of the EAN; and that use is also being made of the MSS, including the Satellite Terminal, by aircraft which utilise Inmarsat's service.
- 4.11 To that end, Ofcom will collect information from Inmarsat to verify that aircraft using the EAN are being fitted with the Satellite Terminal; and that services are being provided using the MSS as well as the Terrestrial Segments.
- 4.12 If it transpires that, after being authorised by Ofcom, Inmarsat is providing services to aircraft exclusively by means of the Terrestrial Segment, Ofcom will consider taking enforcement action on the basis that the Ground-based Stations are not in fact being used as CGCs (i.e. as complementary components of a system for providing MSS in order to improve the availability of the MSS) as is required under the terms of Inmarsat's authorisation.