

IWG-4 Recommendations Regarding Proposals on Integrated MSS Systems

IWG-4 has discussed the topic of Integrated Systems since its March 2009 meeting. Unfortunately, it was not possible to achieve consensus despite several attempts to address this matter under different agenda items of WRC-12.

As a consequence, this document contains two Annexes.

Annex A includes a set of three draft proposals submitted by LightSquared. These draft proposals refer to agenda items 7, 4 and 8.2 and can be found in Attachments A, B and C to Annex A, respectively.

The proposals in Annex A are supported by LightSquared,...

Annex B contains the recommendations from Inmarsat with respect to the LightSquared's draft proposals and an alternative path proposed by Inmarsat.

The views in Annex B are supported by Inmarsat,...

ANNEX A

Overview: LightSquared's Recommended Draft Proposals for WRC-12 Integrated MSS Systems

BACKGROUND:

Integrated MSS Systems¹ use technology to integrate mobile-satellite and terrestrial components within a single system, will operate in the 1525- 1559 MHz and 1626.5-1660.5 MHz bands and will begin operations including deploying Complementary Ground Component (CGC) networks in 2011. Recent FCC decisions have stated that this band and the deployment of CGC is an essential element in the U.S. Administration's initiative to make additional spectrum available for mobile broadband deployment². Currently, the Radio Regulations do not have regulatory and technical provisions to address the unique architectural and operational aspects of the Complementary Ground Component ("CGC") of Integrated MSS Systems. Consequently, it is essential that at the first opportunity, a World Radiocommunication Conference adopt provisions to associate CGC with MSS networks in the bands 1525-1559 MHz and 1626.5-1660.5MHz and also the conditions under which CGC networks will be permitted. Further, because the CGC is a terrestrial deployment that must be authorized by individual administrations, it is imperative to have a harmonized framework for global CGC deployment. Thus, until a future WRC is able to address the allocation status of CGC within Integrated MSS Systems, it is necessary to adopt interim procedures for use by individual administrations for the ITU notification of CGC networks of Integrated MSS networks..

PROPOSALS:

¹ The ITU-R Coordination Committee for Vocabulary ("CCV") is considering the definition of Integrated MSS System given below. This is also the working definition used in ITU-R Working Parties 4C, 4B, and 4A. See, *SUMMARY RECORD OF THE CCV/1-10 MEETING OF THE COORDINATION COMMITTEEFOR VOCABULARY (CCV)*, Document CCV/29, 22 March 2010 (Geneva). Within the ITU-R, the working definition for Integrated MSS Systems is:

An integrated MSS system is a system employing a satellite component and ground component where the ground component is complementary to the satellite component and operates as and is an integral part of the MSS system. In such systems the ground component is controlled by the satellite resource and network management system. Further, the ground component uses the same portions of MSS frequency bands as the associated operational mobile-satellite system.

² In the matter of Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz, ET Docket No. 10-142, Notice of Proposed Rulemaking and Notice of Inquiry, released July 15, 2010, footnote 29.

Considering the imminent deployment of Integrated MSS systems, three proposals have been drafted for WAC recommendation to the FCC as U.S. Proposals for WRC-12. These proposals are:

- 1) Under Agenda Item 4 to modify Recommendation 206 to indicate that Integrated MSS systems are being implemented in the 1525-1559 MHz and 1626.5-1660.5 MHz bands, to define, on an interim basis, MSS as including Integrated MSS systems with CGC in these frequency bands and to urge administrations to include CGC in MSS satellite coordination discussions;
- 2) Under Agenda Item 7, to provide a Resolution [CGC.Notify] with interim procedures for the notification of Complementary Ground Components of Integrated MSS Systems in the 1525-1544 MHz, 1545-1559 MHz, 1626.5- 1645.5 MHz and 1646.5-1660.5 MHz bands, and
- 3) Under Agenda Item 8.2 to propose a WRC-16 Agenda item and an accompanying Resolution [CGC Agenda (WRC-12)] “to consider adopting regulatory, technical and allocation provisions in the Radio Regulations to enable the Complementary Ground Component (“CGC”) of a mobile-satellite service (MSS) system to operate on a co- primary basis with the MSS allocation in the bands 1525-1544, 1545 -1559 MHz., 1626.5- 1645.5 MHz and 1646.5- 1660.5 MHz.

The three proposals build upon one another and, thus, are interdependent as described below.

The Mod Recommendation 206 proposal defines, on an interim basis, MSS in the bands 1525-1544 MHz, 1545-1559 MHz, 1626.5- 1645.5 MHz and 1646.5-1660.5 MHz as including CGC within Integrated MSS System networks. This will recognize that CGC is operating in the bands with the MSS links of the host Integrated MSS System. It urges administrations to include CGC in their MSS satellite coordination discussions. The Resolution [CGC. Notify] proposal creates a mechanism for the CGC networks being implemented by the notifying administration of the Integrated MSS System network and other Administrations implementing CGC to associate the CGC networks with the Integrated MSS network. It provides interim procedures, prior to action at WRC-16, that would permit the notifying administration to inform the ITU – BR and other administrations that the notified MSS network is an Integrated MSS System network, and to confirm that associated CGC networks that may be implemented by other administrations would operate within the parameters of the notified Integrated MSS System network. Resolution [CGC.Notify] would be made applicable only to the MSS in the 1525-1544MHz and 1555- 1559 MHz and 1626.5 -1645.5 MHz and 1646.5-1660.5 MHz bands

Finally, the third proposal is for a WRC-16 Agenda item with an attendant Resolution [CGC.Agenda (WRC-12)] that addresses all of the regulatory, technical and operational issues that are to be studied in the intervening period between WRC-12 and WRC-16 for WRC-16 consideration in addressing the appropriate allocation mechanism and structure to support CGC networks operating in an Integrated MSS network on a primary basis.

The three proposals are interdependent and are needed to provide through Mod Recommendation 206 and Resolution [CGC.Notify], an interim regulatory structure within the context of the Radio Regulations that will recognize CGC deployments and operations within Integrated MSS System networks until WRC-16 considers, through Resolution [CGC.Agenda], appropriate regulatory and operational modifications to the Radio Regulations to accommodate deployment and operation of CGC on a permanent basis.

The three Draft proposals are attached and are recommended for adoption by the FCC's WRC Advisory Committee as recommended draft U.S. proposals.

ATTACHMENT A

United States of America DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda Item 7: *To consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: “advance publication, coordination, notification and recording procedures of the Radio Regulations for frequency assignments pertaining to space services,”³ in accordance with Resolution 86 (Rev. WRC 07).*

Background: Integrated MSS Systems⁴ employ technology that integrates mobile-satellite components and terrestrial components (“complementary ground component or ‘CGC’”) into a single system reusing MSS frequencies for both components. Currently, there are provisions in the Radio Regulations to accommodate satellite systems and terrestrial networks separately, but additional provisions are needed to accommodate the unique aspects of Integrated MSS Systems.

Resolution 86 resolves to invite future world radiocommunication conferences to:

- 1) *to consider any proposals which deal with deficiencies and improvements in the advance publication, coordination, notification and recording procedures of the Radio Regulations for frequency assignments pertaining to space services which have been identified by administrations as appropriate, and 2) to ensure that these procedures and the related appendices of the Radio Regulations reflect the latest technologies as far as possible.*⁵

Discussion: Currently, the Radio Regulations lack certain regulatory provisions for notifying and registering the complementary ground component (“CGC”) of Integrated MSS Systems. Because the architectural and operational features of Integrated MSS Systems are such that the MSS component and terrestrial component are integrated within a single network, it is essential to recognize and give consideration to both elements of these networks. In the bands 1525-1544 MHz, 1545-1559 MHz, 1626.5-1645.5 MHz and 1646.5- 1660.5 MHz , at least one MSS operator will roll out CGC deployments in 2011.

Consequently, it would be prudent to provide, at least on an interim basis as a minimum, procedures in the Radio Regulations to take account of CGC deployment in the bands 525-1544 MHz, 1545-1559 MHz, 1626.5- 1645.5 MHz and 1646.5-1660.5 MHz.

³ Int’l Telecomm. Union [ITU], *Implementation of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, at resolves to invite future world radiocommunication conferences ¶ 1, Resolution 86 (Rev. WRC-07) (2007).*

⁴ The ITU-R Coordination Committee for Vocabulary (“CCV”) is considering the definition of Integrated MSS System given below. This is also the working definition used in ITU-R Working Parties 4C, 4B, and 4A. See, *SUMMARY RECORD OF THE CCV/1-10 MEETING OF THE COORDINATION COMMITTEE FOR VOCABULARY (CCV)*, Document CCV/29, 22 March 2010 (Geneva).

⁵ *Supra* note 1, *resolves to invite future world radiocommunication conferences ¶¶ 1-2.*

Therefore, interim procedures are proposed in New Resolution [CGC.Notify] to provide a mechanism for notifying and registering CGC stations, and for submitting to the ITU BR and subsequently entering information for the notification of CGC stations and for associating CGC assignments with their operational MSS systems within the bands referenced above.

Additionally, Resolution [CGC. Notify] instructs the ITU Radiocommunication Bureau on procedures for handling such CGC information submitted in accordance with interim procedures provided in Resolution [CGC.Notify]. Resolution [CGC.Notify] will supplement the current Article 9 and Article 11 procedures that are applicable to the satellite component of Integrated MSS Systems.

USA/02 ADD

Resolution [CGC.Notify] (WRC-2012)

Interim Procedures for Notification and Recording of the Complementary Ground Component of Integrated MSS Systems⁶ in 1525-1544 MHz, 1545-1559 MHz, 1626.5- 1645.5 MHz and 1646.5- 1660.5 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that MSS systems can provide service over a wide geographic area and are particularly suited for emergency and disaster recovery communications and rural communications;
- b) that MSS systems can have limited capacity for providing radio communications services in urban areas due to natural and/or man-made blockage;
- c) that an MSS system with an integrated Complementary Ground Component (CGC) system will extend and improve the availability of radio communications services in areas where reliable current and next generation communications are not otherwise provided with one or more space stations or cannot otherwise be assured, and in this way increase spectrum efficiency in bands allocated to the mobile-satellite service;
- d) that a number of administrations are implementing or planning to implement Integrated MSS Systems in parts of the bands identified for the satellite component of IMT in the bands 1525- 1559 MHz and 1626.5- 1660.5 MHz;
- e) that in providing radiocommunication services, there is a need continually to exploit technological developments to increase the efficiency of use of finite radiocommunication spectrum resources as technology permits.

recognizing

- a) that the bands 1525-1544 MHz, 1545-1559 MHz, 1626.5-1645.5 MHz and 1646.5-1660.5 MHz are allocated on a co-primary basis to the mobile-satellite service and to other services;
- b) that Resolution 215 (Rev.WRC-97) addresses the coordination process among mobile-satellite systems and the efficient use of the allocations to the mobile –satellite service in the 1- 3 GHz range;

⁶ An Integrated MSS System is a system employing a satellite component and ground component where the ground component is complementary to the satellite component and operates as and is an integral part of the MSS system. In such systems the ground component is controlled by the satellite resource and network management systems. Further, the ground component uses the same portions of MSS frequency bands as the associated operational mobile-satellite system.

- c) that the distress, urgency and safety communications of the Global Maritime Distress and Safety System and the aeronautical mobile-satellite (R) service have priority access and immediate availability in specified bands over all other mobile-satellite service communications in accordance with Nos. 5.353A and 5.357A;
- d) that the frequency bands referred to in *recognizing a)* are also used by other systems in the services to which the bands are allocated, and that these systems and services need to be protected from harmful interference;
- e) that the deployment of the Complementary Ground Component is predicated upon the Complementary Ground Component being integrated with one or more space stations of an Integrated MSS System;
- f) that the Complementary Ground Component will use the same allocated and assigned frequency bands as the associated MSS system;
- g) that the Complementary Ground Component will be located only within the service area of its associated MSS system and is to be controlled by the Integrated MSS System network management system;

noting

- a) that, in general, co-frequency sharing and reuse of the spectrum by independently controlled mobile-satellite and terrestrial mobile systems is not feasible in the same geographic area;
- b) that Integrated MSS Systems can avoid the spectrum-sharing compatibilities in *noting 1)*;
- c) that Article 11 provisions No 11.2 through 11.11 requires that “ Any frequency assignment to a transmitter station and to its associated receiving station shall be notified to the Bureau”;
- d) that the coordination and notification procedures of Articles 9 and 11 apply to the MSS component of Integrated MSS Systems;
- e) that currently Appendix 4 of the Radio Regulations does not contain provisions for associating notified Complementary Ground Component stations with MSS components of their Integrated MSS system;
- f) that the mobile terminals (consisting of mobile earth stations and mobile stations in the same platform) of such Integrated MSS Systems are capable of communicating directly via multiple radio interfaces with the base stations of the Complementary Ground Component and the space stations of the associated mobile satellite system using the same common frequency bands;

resolves

1. that administrations choosing to associate CGC operations with Integrated MSS network frequency assignments shall apply the attached Annex to the Complementary Ground Component of Integrated MSS systems as described in the *recognizings*.

instructs the Radiocommunication Bureau

1. to implement the interim procedures of the attached Annex for base stations transmitting in the bands 1 525 - 1544 MHz, and 1 545 - 1 559 MHz, and mobile stations transmitting in the bands 1626.5 - 1645.5 MHz, and 1646.5 - 1660.5 MHz that are integrated with MSS systems operating in the same frequency bands and in territories within the MSS system service area provided that coordination or notification information has been submitted for the associated MSS system in accordance with Article 9 or Article 11;

ANNEX

Interim Procedures for Notification and Recording of Complementary Ground Components of Integrated MSS Systems

Introduction

This Annex provides interim procedures for the submission of technical information to the ITU Radiocommunications Bureau (BR) for the Complementary Ground Components of Integrated MSS networks in the 1525-1544 MHz, 1545-1559 MHz, 1626.5- 1645.5 MHz and 1646.5 – 1660.5MHz bands. These interim procedures provide information that is to be submitted by the Notifying Administration of the Integrated MSS system and by Administrations implementing the Complementary Ground Component of the Integrated MSS system.

Interim Procedure

A) Administrations that are implementing a Complementary Ground Component of an Integrated MSS system shall submit the following information to the ITU-BR in accordance with these procedures: An Appendix 4 Annex 1 notice for stations of a Complementary Ground Component:

1. in the remarks of the Appendix 4 Annex 1 notice,
 - a. indicate that the stations are Complementary Ground Components of an Integrated MSS System submitted in accordance with these procedures, and
 - b. specify the associated MSS system and related ITU IFIC and Network Identifier.

B) The Notifying Administration for an MSS system of an Integrated MSS system shall submit an Appendix 4 Annex 2 notice and:

1. shall indicate in the submittal letter for the Appendix 4 Annex 2 notice that the MSS network is an Integrated MSS network;
2. shall provide a cross reference to the Appendix 4 Annex 1 filing which has the characteristics of stations of the Complementary Ground Component; and
3. shall confirm separately any Appendix 4 Annex 1 notice that is submitted by another Administration implementing a Complementary Ground Component that is associated with the Integrated MSS system.

C) Administrations notifying Integrated MSS systems shall include reference to the Appendix 4 Annex 1 notice of the associated Complementary Ground Component of an Integrated MSS system in the Article 11 notification.

The ITU Radiocommunications Bureau shall:

1. process complete notices for Complementary Ground Component base stations transmitting in the bands 1 525 - 1544 MHz, and 1 545 - 1 559 MHz, and mobile stations transmitting in the bands 1626.5 - 1645.5 MHz, and 1646.5 - 1660.5 MHz that are integrated with MSS systems operating in the same frequency bands and in territories within the MSS system service area provided that coordination or notification information has been submitted for the associated MSS system in accordance with Article 9 or Article 11;

2. where possible, include the reference to the Appendix 4, Annex 1 Complementary Ground Component notice with the publication of the Appendix 4 Annex 2 information for the MSS system of the Integrated MSS system;

3. record such CGC stations as integrated with MSS systems on the basis of:
 - a. a statement by an Administration submitting Complementary Ground Component notices in accordance with this interim procedure identifying the MSS system with which the Complementary Ground Component is integrated; and

 - b. a confirmation of the above statement by the Administration notifying the Integrated MSS System;

4. record such CGC station notices, in accordance with the Radio Regulations, as appropriate, together with the identification of the associated MSS system, concurrently with, or after assignments are recorded for the associated MSS system in the Integrated MSS System; and

5. if the MSS space station assignment is cancelled or suppressed, the Bureau shall review the earth station and CGC station(s) associated with the MSS space station and request the Notifying administration of the earth stations or the CGC stations to either cancel or suitably modify the basic characteristics of the entry.

Reason: *To provide interim notification and recording procedures for the Complementary Ground Component of Integrated MSS Systems by providing a Resolution [CGC.Notify] with interim procedures for filing notices of stations of the Complementary Ground Component of Integrated MSS Systems and to identify the relevant associated mobile satellite network for the Complementary Ground Component. The interim procedures provided in Resolution [CGC.Notify] include procedures for the ITU Radiocommunication Bureau for handling such CGC information submitted by its notifying administration. This Resolution [CGC.Notify] will supplement the current Article 9 and Article 11 procedures that are applicable to the satellite component of Integrated MSS Systems.*

ATTACHMENT B

United States of America DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda Item 4: *in accordance with Resolution 95 (Rev.WRC 07), to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;*

Background: Integrated MSS Systems⁷ employ technology that integrates mobile-satellite components and terrestrial components (“complementary ground component or ‘CGC’”) into a single system reusing MSS frequencies for both components. Currently, there are provisions in the Radio Regulations to accommodate satellite systems and terrestrial networks separately, but additional provisions are needed to accommodate the unique aspects of Integrated MSS Systems.

Recommendation 206 (WRC-07) recognized that some administrations are implementing Integrated MSS Systems. This is, or will be, occurring on both a regional and global basis beginning as early as 2011. Recommendation 206 (WRC-07) invited the ITU-R to perform studies on sharing, technical and regulatory issues regarding these Integrated Systems. Since WRC-07, in accordance with Recommendation 206 (WRC-07), a number of studies related to Integrated MSS Systems have been initiated in ITU-R Working Parties 4B and 4C. Importantly, at least one Integrated MSS System authorized to operate in the bands 1525-1559 and 1626.5-1660.5 MHz will begin deployment of CGC networks in 2011.

Discussion: With the imminent deployment of full Integrated MSS Systems in the 1525-1559 and 1626.5-1660.5 MHz bands, and because specific provisions for the complementary ground component of an Integrated MSS System are needed in the current Radio Regulations,⁸ it is imperative that on an interim basis as a minimum,

⁷ The ITU-R Coordination Committee for Vocabulary (“CCV”) is considering the definition of Integrated MSS System given below. This is also the working definition used in ITU-R Working Parties 4C, 4B, and 4A. See, *SUMMARY RECORD OF THE CCV/1-10 MEETING OF THE COORDINATION COMMITTEE FOR VOCABULARY (CCV)*, Document CCV/29, 22 March 2010 (Geneva).

⁸ Other organizations have recognized the lack of Radio Regulation provisions to cover the case of Integrated Systems. For example, in Europe, the CEPT Conference Preparatory Group Project Team A (CPG-PTA) has taken a preliminary position that the existing radio regulations need additional provisions for regulatory provisions for full deployment of MSS systems with CGC because of the absence of procedures for CGC notification, registration and coordination to facilitate the full deployment of MSS systems with CGC. (See Conference of European Postal and Telecommunications Administrations [CEPT], *Working Document Agenda Item 1.2*, at 11, CPG-PTA Temp 03.) Furthermore, the CPG-PTA indicates that the most appropriate option is to introduce a new definition for the service combining features of mobile service and mobile satellite service to enable the introduction of CGC, for example an “Integrated Satellite service.” (*Id.* at 12.)

provisions are adopted into the Radio Regulations at WRC-12 to provide regulatory guidance for the treatment of Integrated MSS Systems, pending the completion of ITU-R studies, and consideration of Integrated MSS System matters at the next WRC. This will provide regulatory certainty and guidance for administrations to permit CGC deployment in their territories. This will ease rollout of service as well as promote more efficient use of spectrum and will facilitate interference control and protection.

USA/ /01 MOD

RECOMMENDATION 206 (WRC-07)

**Use of Integrated Mobile-Satellite Service
and ground component systems in some frequency bands
identified for the satellite component of International
Mobile Telecommunications**

The World Radiocommunication Conference (Geneva, 2012),

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considering

- a) that mobile-satellite service (MSS) systems may provide service to a wide area;
- b) that MSS systems can have a limited capacity for providing radiocommunication services in urban areas due to natural or man-made obstacles and that the ground component of an integrated MSS system can mitigate blockage areas, as well as allow for indoor service coverage;
- c) that MSS systems can improve coverage of rural areas, thus being one element that can bridge the digital divide in terms of geography;
- d) that MSS systems are suitable for public protection and disaster relief communications, as stated in Resolution **646 (WRC-03)**;
- e) that the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz and 2 483.5-2 500 MHz are among those identified in Resolution **225 (Rev.WRC-07)** for administrations wishing to implement the satellite component of International Mobile Telecommunications (IMT);
- f) that the bands mentioned in *considering e*) are allocated on a primary basis to the mobile-satellite services and other services and that not all of them are allocated to the mobile service;
- g) that the bands 1 980-2 010 MHz and 2 170-2 200 MHz are identified for use by the satellite component of IMT-2000 in accordance with Resolution **212 (Rev.WRC-07)**;

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h) that within their territories in some or parts of the bands identified in *considering e)* and *g)* and in parts of the band 2010-2025 MHz in some countries in Region 2, some administrations have authorized or plan to authorize MSS system operators to establish an integrated ground component to their MSS systems (“Integrated System”) and under certain conditions determined at the national level such as:

- i) the ground component is complementary to, and operates as an integral part, of the MSS system and, together with the satellite component, provides an integrated service offering;
 - ii) the ground component is controlled by the satellite resource and network management system;
 - iii) the ground component uses the same designated portions of the frequency band as the associated operational MSS system;
- i)* that ITU-R has performed frequency sharing studies and has determined that the coexistence between independent systems in the MSS and systems in the mobile services in the same spectrum without harmful interference is not feasible in the same or adjacent geographical area,

recognizing

- a)* that ITU-R has not performed studies on sharing, technical or regulatory issues with regard to integrated MSS and ground component systems, but that some administrations have performed such studies;
- b)* that the radionavigation-satellite service in the 1 559-1 610 MHz band and the radio astronomy service in the bands 1 610.6-1 613.8 MHz and 1 660-1 670 MHz need to be protected from harmful interference;
- c)* that the MSS needs to be protected from harmful interference that may be caused by the introduction of the ground component of Integrated Systems;
- d)* that Nos. **5.353A** and **5.357A** are applicable to MSS systems in different portions of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz with respect to the spectrum requirements and prioritization of communications for the Global Maritime Distress and Safety System and the aeronautical mobile-satellite (R) service,

noting

- a)* that the combined wide-area and urban coverage capabilities of Integrated [MSS](#) Systems may contribute to meeting the particular needs of developing countries such as is noted in Resolution **212 (Rev.WRC-07)**;

- b) that some administrations that are planning to implement or are implementing Integrated MSS Systems within their national territories have imposed limitations, in rules and authorization actions, on the e.i.r.p. density that the ground component of such systems may produce into bands allocated to the radionavigation-satellite service;
- c) that there are a limited number of frequency bands allocated to the MSS, that these bands are already congested, and that the introduction of integrated ground components may in some instances make spectrum access for other MSS systems more difficult;
- d) that administrations implementing Integrated MSS Systems may provide, in bilateral or multilateral consultations among administrations, information on system characteristics of the ground component,

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recommends

1. to invite ITU-R to conduct studies, as appropriate, taking into account existing systems and those proposed to be used soon and the above *considering, recognizing and noting,*
2. to invite ITU-R to conduct compatibility studies between Integrated MSS Systems and other services operating in the bands 1525-1544MHz, 1545-1559 MHz, 1626.5-1645.5 MHz and 1646.5- 1660.5 MHz with a view to completing studies in time for RA-15
3. that on an interim basis until WRC-15, in the bands 1525-1544MHz , 1545-1559 MHz, 1626.5- 1645.5 MHz and 1646.6-1660.5 MHz, the mobile-satellite service as defined in No 1.25 includes Integrated MSS Systems defined as:
 - a. An Integrated MSS System is a system employing a satellite component and ground component where the ground component is complementary to the satellite component and operates as and is an integral part of the MSS system, In such systems the ground component is controlled by the satellite resource and network management system. Further, the ground component uses the same portions of MSS frequency bands as the associated operational mobile-satellite system.

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invites administrations

1. to participate as necessary in the ITU-R studies taking into account recognizing a).
2. to include within MSS satellite coordinations, conducted pursuant to No 9.11A and No 5.354, CGC stations associated with relevant MSS networks in the 1525-1544 MHz, 1545-1559 MHz,1626.5-1645.5 MHz and 1646.5-1660.5 MHz bands.

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Reason: Pending action at the next WRC to provide guidance on the treatment of complementary ground component of Integrated MSS Systems, to participate as

necessary in the ITU-R studies taking into account *recognizing a*); to invite studies specifically on CGC operations in 1525-1545 MHz, 1546-1559Mhz, 1626.5-1645.5 MHz, and 1646.5-1660.5 MHz and to urge administrations to include CGC stations in relevant MSS coordinations in these bands.

ATTACHMENT C

United States of America

DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda Item 8.2: *to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution 806 (WRC 07);*

Background: At WRC-07, one Administration proposed changes to Article 5 of the Radio Regulations, as well as associated consequential changes, to provide for Integrated MSS Systems.⁹ At WRC-07, discussions on this matter led to WRC-07 adopting Recommendation 206 (WRC-07).

Recommendation 206 (WRC-07) recognized that some administrations were already implementing Integrated MSS Systems, and recommended that the ITU-R conduct studies on such systems, and also invited administrations to participate in these studies. Since WRC-07, in accordance with Recommendation 206 (WRC-07), a number of studies related to Integrated MSS Systems have been initiated in ITU-R Working Party 4C and Working Party 4B. These studies are progressing and should be completed well in advance of WRC-15.

Discussion: Currently, the Radio Regulations do not have regulatory and technical provisions to address the unique regulatory and operational aspects of the complementary ground component (“CGC”) of an Integrated MSS Systems. The attached proposals address this situation.

Integrated MSS Systems intended to operate in the bands 1525-1559 MHz and 1626.5-1660.5 MHz, will begin operations, including deploying CGC networks, in 2011. It is essential that at the first opportunity a World Radiocommunication Conference adopt provisions to recognize the CGC component in the bands 1525-1559 MHz and 1626.5 – 1660.5 MHz, as well as the conditions under which such systems shall be permitted.

⁹ The ITU-R Coordination Committee for Vocabulary (“CCV”) is considering the definition of Integrated MSS System given below. This is also the working definition used in ITU-R Working Parties 4C, 4B, and 4A. See, *SUMMARY RECORD OF THE CCV/1-10 MEETING OF THE COORDINATION COMMITTEE FOR VOCABULARY (CCV)*, Document CCV/29, 22 March 2010 (Geneva). Within the ITU-R, the working definition for Integrated MSS Systems is:

An integrated MSS system is a system employing a satellite component and ground component where the ground component is complementary to the satellite component and operates as and is an integral part of the MSS system. In such systems the ground component is controlled by the satellite resource and network management system. Further, the ground component uses the same portions of MSS frequency bands as the associated operational mobile-satellite system.

Further, because the CGC component will be authorized by individual administrations, it is imperative to provide guidance for the notification of CGC networks to the ITU-R, as well as to provide a harmonized framework for their global deployment. The attached proposals provide a WRC-15 agenda item to address these matters, as well as an associated Resolution.

Proposals:

Agenda Item 8.2

RESOLUTION 806 (WRC-07)

Preliminary agenda for the 2015 World Radiocommunication Communication Conference

USA/ /01 **ADD**

- X.X to consider adopting regulatory, technical and allocation provisions in the Radio Regulations to enable the Complementary Ground Component (“CGC”) of a mobile-satellite service (MSS) system to operate on a co- primary basis with the MSS allocation in the bands 1525-1544 MHz, 1545 -1559 MHz, 1626.5- 1645.5 MHz and 1646.5- 1660.5 MHz taking into account MOD Recommendation 206 (WRC-12) and Resolution [CGC.Agenda (WRC-12)] and the results of any compatibility and sharing studies with other radio services operating in these bands.

Reason: Integrated MSS Systems are deploying in the bands 1525-1544 MHz, 1545 -1559 MHz, 1626.5- 1645.5 MHz and 1646.5- 1660.5 MHz in 2011. These deployments will be both regional and global. This agenda item will allow WRC -15 to adopt regulatory, technical and allocation provisions to enable the deployment of the complementary ground component with MSS systems.

USA/ /02 **ADD**

Resolution [CGC.Agenda] [(WRC-12)]

Consideration of Regulatory, Allocation and Technical Provisions of Integrated MSS Systems¹⁰ in the Bands 1525-1544 MHz, 1545 -1559 MHz, 1626.5- 1645.5 MHz and 1646.5- 1660.5 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that mobile-satellite service (MSS) systems may provide service to a wide area;
b) that MSS systems can have limited capacity for providing radiocommunication services in urban areas due to natural or man-made obstacles;

¹⁰ An Integrated MSS System is a system employing a satellite component and ground component where the ground component is complementary to the satellite component and operates as and is an integral part of the MSS system. In such systems the ground component is controlled by the satellite resource and network management systems. Further, the ground component uses the same portions of MSS frequency bands as the associated operational mobile-satellite system.

- c) that a complementary ground component of an integrated MSS system can mitigate blockage areas, as well as allow for indoor service coverage;
 - c) that MSS systems can improve coverage of rural areas, thus being one element that can bridge the digital divide in terms of geographical coverage;
 - d) that MSS systems are suitable for public protection and disaster relief communications, as stated in Resolution 646 (WRC-03);
 - e) that an MSS system with an integrated Complementary Ground Component (CGC) system will extend and improve the availability of radiocommunications services in areas where reliable current and next generation communications are not otherwise provided with one or more space stations or cannot otherwise be assured, and in this way increase spectrum efficiency in bands allocated to the Mobile-Satellite service;
 - f) that the bands 1 525-1 544 MHz, 1 545-1 559 MHz, and 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz are allocated on a co primary basis to the mobile-satellite service and other services;
 - g) that within their territories in the bands identified in *considering f)*, some administrations have authorized or plan to authorize MSS system operators to establish an integrated complementary ground component to their MSS systems (“Integrated MSS System”);
 - h) that Integrated MSS Systems meet certain conditions such as:
 - i) the ground component is complementary to, and operates as an integral part, of the MSS system and, together with the satellite component, provides an integrated MSS service offering;
 - ii) the ground component is controlled by the satellite resource and network management system;
 - iii) the ground component reuses the MSS frequencies of the associated mobile-satellite system;
 - j) that ITU-R has performed frequency sharing studies and has determined that the coexistence between independent systems in the MSS and systems in the mobile services in the same spectrum without harmful interference is not feasible in the same or adjacent geographical area;
- recognizing*
- a) that within the ITU-R, studies are underway regarding the compatibility of the CGC element of Integrated MSS Systems with other services in the bands 1525-1544 MHz, 1545 -1559 MHz, 1626.5- 1645.5 MHz and 1646.5- 1660.5MHz;
 - b) that some administrations have already performed such studies;
 - c) that in the bands 1545-1555 MHz, 1646.5- 1656.5 MHz complementary terrestrial networks are already permitted for use in conjunction with AMS(R)S systems;
 - d) that in providing radiocommunication services there is continuing need to exploit technological developments to increase the efficiency of use of finite radiocommunication spectrum resources as technology permits;
 - e) that some administrations will deploy Integrated MSS Systems beginning in 2011.

noting

- a) that the combined wide-area and urban coverage capabilities of Integrated MSS Systems may contribute to meeting the particular needs of developing countries such as is noted in Resolution 212 (Rev.WRC-07);
- b) that the radionavigation-satellite service in the 1 559-1 610 MHz band and the radio astronomy service in the bands 1 610.6-1 613.8 MHz and 1 660-1 670 MHz need to be protected from harmful interference;
- c) that there are a limited number of frequency bands allocated to the MSS, and that Integrated MSS systems can coexist with MSS systems without CGC;
- d) that on an interim basis administrations implementing Integrated MSS Systems shall, in accordance with Resolution [CGC.Notify (WRC-12)], provide to the Radiocommunications Bureau, information on system characteristics of their CGC component.

Resolves

- 1. that in time for consideration at the World Radiocommunication Conference -15, the ITU-R should conclude compatibility studies regarding Integrated MSS Systems and other services operating in the bands 1525- 1544 MHz,1545-1559 MHz,1626.5- 1645.5MHz and 1646.5- 1660.5 MHz.
- 2. that in time for consideration at the WRC-15, to develop necessary regulatory mechanisms to enable coordination, notification and recording in the Master International Frequency Register of the CGC of a mobile-satellite network operating in the bands 1525-1544 MHz,1545-1559 MHz,1626.5- 1645.5MHz and 1646.5- 1660.5 MHz
- 3 that WRC-15 is to consider adopting regulatory, technical and allocation provisions in the Radio Regulations to enable the Complementary Ground Component (“CGC”) of a mobile satellite service system to operate on co primary basis with the mobile satellite service allocation in the bands 1525- 1544 MHz,1545-1559 MHz,1626.5-1645.5MHz and 1646.5- 1660.5 MHz taking into account MOD Recommendation 206 (WRC-12), (WRC-12) and Resolution [CGC.Agenda (WRC-12)] and the results of any compatibility and sharing studies with other radio services operating in these bands.
- 4 that on an interim basis, and subject to confirmation by WRC-15, in the bands 1525-1544 MHz, 1545-1559 MHz, 1626.5-1645.5 MHz and 1646.5-1660.5 MHz the mobile-satellite service as defined in No 1.25 includes Integrated MSS Systems defined as:

An Integrated MSS System is a system employing a satellite component and ground component where the ground component is complementary to the satellite component and operates as and is an integral part of the MSS system. In such systems the ground component is controlled by the satellite resource and network management system. Further, the ground component uses the same portions of MSS frequency bands as the associated operational mobile-satellite system. ;

invites ITU-R

1 _____ to conduct in time for WRC-15 the necessary studies leading to technical, regulatory and operational recommendations to the Conference, enabling that Conference to decide on appropriate allocations for the operation of complementary ground component of Integrated MSS systems on a co primary basis with the mobile satellite service allocation,

2 _____ that the studies referred to in *invites ITU-R 1* should include sharing and compatibility studies with services already having allocations in the bands 1525-1545MHz, 1545-1559 MHz, 1626.5- 1645.5 MHz and 1646.50 1660.5 MHz;

3 _____ to produce a report or a recommendation, as appropriate, on how to accommodate Integrated MSS systems in the bands in *invites ITU-R 2*,

Reason: To provide for consideration by WRC-15 of new allocations and Radio Regulations to address Integrated MSS Systems and associated Complementary Ground Components which will begin deploying in 2011.

ANNEX B

Inmarsat's Recommendation on LightSquared's Draft Proposals for WRC-12 on Integrated MSS Systems

Inmarsat's Recommendation on LightSquared's Draft Proposals for WRC-12 on Integrated MSS Systems

Inmarsat takes note of LightSquared's three proposals summarized in document IWG-4/074 (r1) for the IWG-4 for its next meeting on the following items:

- 1) Agenda Item 4 to modify Recommendation 206 into a Resolution [IMS 1.5/1.6 GHz (WRC-12)];
- 2) Agenda Item 7, to provide a Resolution [CGC.Notify]; and
- 3) Agenda Item 8.2 to propose a WRC-16 Agenda Item and an accompanying Resolution [CGC.Agenda (WRC-12)].

Inmarsat appreciates the intent of LightSquared's proposals. In fact, Inmarsat has cooperated with LightSquared to enable deployment of Ancillary Terrestrial Components, also known as Complementary Ground Component (ATC/CGC) base stations, including significant modifications to permit higher power operations to provide advanced mobile wireless services in North America. This process has worked well for both operators, notifying Administrations, and consumers. Inmarsat believes that the model that was used for coordination of ATC/CGC base stations in North America and other regions can serve as a framework for deployment of ATC/CGC in other regions as well.

Disadvantages of the LightSquared Proposals

In large part because the process followed in North America has worked so well, Inmarsat disagrees with the need for and desirability of proposing new ITU procedures for coordination and notification of ATC/CGC base stations. Inmarsat does not share the view that it is necessary to take the significant step of proposing to modify the ITU Radio Regulations (RRs) to accommodate ATC/CGC base stations. Inmarsat believes that the current RRs provide adequate flexibility to accommodate ATC/CGC base stations in the current ITU procedures.

Any ITU action would have to be preceded by detailed studies at the national and international levels to determine the conditions for ATC/CGC use. ITU studies would tend to be based on worst case assumptions and will delay the implementation of ATC/CGC in other countries and regions while they are pending. It is Inmarsat's belief that such studies are best carried out on a national and system specific basis to take into account actual conditions and concrete systems. Adding ITU studies to the process would create unnecessary duplication and require significant additional resources for all the necessary participants. In short, we 2

believe that it is preferable to have the introduction of ATC/CGC as an industry-driven process.

The proposed studies and implementation of additional procedures will also increase the administrative burden on the Radiocommunication Bureau (BR) as there could be many thousands of requests to notify terrestrial base stations, further taxing the BR's limited resources for processing satellite and other network filings.

Finally, as has been the case in the past, proposing and advocating for these proposed procedures nationally, regionally and at the upcoming World Radiocommunication Conference (WRC-12) will be contentious and will be enormously resource-intensive for the ITU, Administrations, and operators. Inmarsat, therefore, cannot support the proposals to include ATC/CGC into the ITU coordination process.

Alternative Path

Inmarsat believes that there is a better approach, based on the successful U.S. precedent, to achieving the goals that LightSquared is trying to obtain without the need to develop interim procedures or permanently modify the Radio Regulations and without the disadvantages of LightSquared's proposals identified above. Inmarsat submits the following alternative roadmap for consideration by the IWG-4 as a path forward for international deployment of ATC/CGC. This approach is intended to demonstrate that the goals that LightSquared is trying to achieve can be obtained more quickly and potentially result in greater flexibility with minimal impact on limited ITU and Administration resources.

There is a well-established international MSS coordination process covered by Article 9 of the RRs. It is Inmarsat's belief that that process can accommodate the goals that LightSquared is trying to achieve. Specifically, proponents of ATC/CGC networks should undertake a review of the current L-band coordination environment for each of the countries where ATC/CGC deployment is contemplated and conduct satellite coordination, if required. If satellite coordination is necessary and complete or well underway, the ATC/CGC proponents can commence discussions with other satellite operators to develop technical solutions to the coordination of ATC/CGC under existing ITU procedures.

Once agreements between the affected operators are in place, the MSS operator can approach regulators to endorse ATC/CGC operation. To facilitate this process, ATC/CGC proponents can educate regulators on already existing regulatory models in other countries, such as that in the United States. ¹

The advantage of the above approach compared to pursuing Recommendations or Resolutions at WRC-12 is that it avoids the potential development of interference rules with unnecessarily conservative or restrictive requirements. Instead, it allows for maximum deployment/operational flexibility based on operator-to-operator agreements under the

¹ *Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-band, and the 1.6/2.4 GHz Bands; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, Report and Order and Notice of Proposed Rulemaking*, FCC 03-15, 18 FCC Rcd 1962 (2003), modified by Order on Reconsideration, 18 FCC Rcd 13590 (2003), reconsidered in part in *Memorandum Opinion and Order and Second Order on Reconsideration*, FCC 05-30, 20 FCC Rcd 4616 (2005), further reconsideration pending. ³

auspices of notifying Administrations. In addition, the process proposed by Inmarsat would speed deployments by avoiding years of unnecessary study and save resources for the Bureau, Member States, Sector Members and operators.

Inmarsat believes that there is a valid role for regional and ITU organizations to play in facilitating the international deployment of ATC/CGC. For example, regional and ITU organizations could facilitate sharing of information papers on ATC/CGC deployment and hold forums and workshops on the benefits of ATC/CGC and regulatory best practices. Specifically, these fora could be valuable for detailing what ATC/CGC is and how it works, the potential benefits for spectrum efficiency, the potential public interest benefits (e.g., disaster recovery), and how ATC has been implemented from a regulatory and coordination perspective in other countries and regions. In addition, these fora could be a place for regulators to describe recommended procedures or best practices on how to coordinate ATC/CGC networks as part of MSS coordination procedures. We note that such an information paper was prepared prior to the last WRC, but much has happened since then and an update would be appropriate.

Conclusion

Inmarsat respectfully requests that the IWG-4 consider these factors in evaluating the necessity of proceeding with LightSquared's risky, complex and unnecessary approach to international deployment of ATC/CGC through modification of the ITU Radio Regulations. Inmarsat also requests that this document be forwarded to the WRC Advisory Committee (WAC) if the IWG-4 decides to send LightSquared's proposals to the WAC without consensus.